The NATIONAL GEOGRAPHIC MAGAZINE

Vol. XVII MARCH, 1906 No. 3

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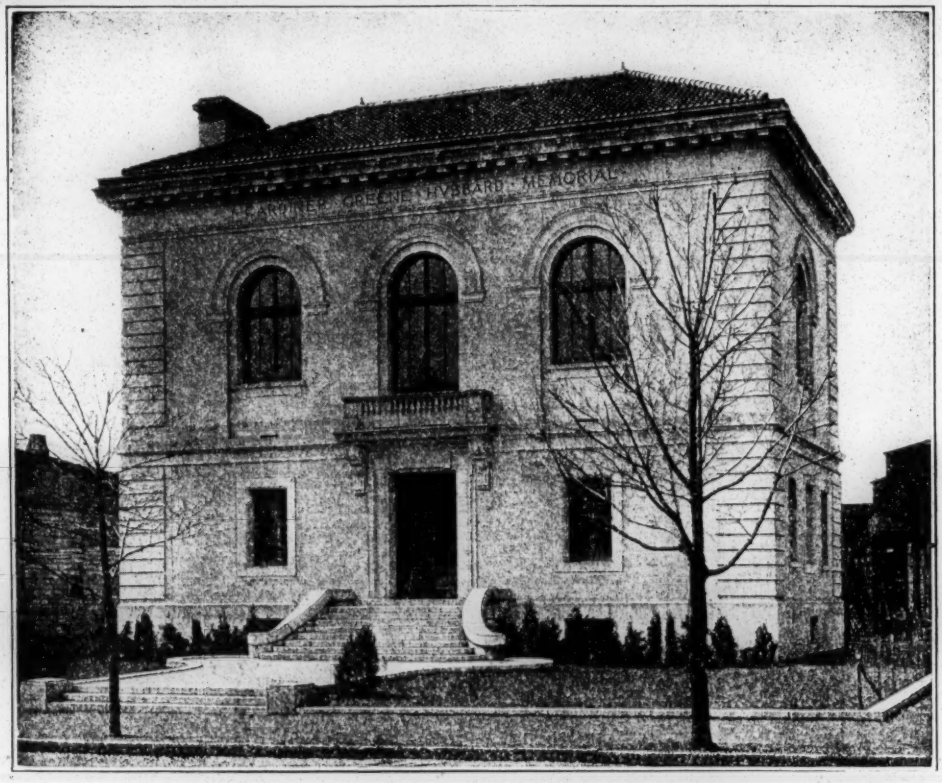

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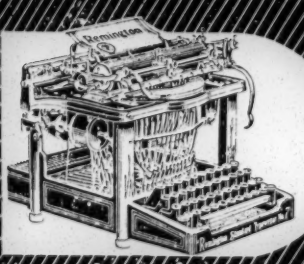

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VOL. XVII, No. 3 WASHINGTON MARCH, 1906

THE NATIONAL GEOGRAPHIC MAGAZINE

MOROCCO, "THE LAND OF THE EXTREME WEST"

AND THE STORY OF MY CAPTIVITY

BY ION PERDICARIS

The following article is the substance of two addresses to the National Geographic Society, November 17, 1905, and February 20, 1906. In the first address Mr Perdicaris described the government and people, and in the second his capture by Raisuli and his experiences with that remarkable man. For the very unique and instructive pictures, excepting those on pages 136 and 137, the Magazine is also indebted to Mr Perdicaris, who sent to Tangier specially for them. The pictures on pages 136 and 137 are from photographs presented by Mr David G. Fairchild.

IN the attempt of the French to secure a permanent control in Morocco, in the intervention of Germany, and in the assemblage of a Moroccan conference at Algeciras in Spain, we may witness the prelude to the closing act in the drama of Moorish independence. Very possibly the young Sultan, Abd El Aziz;* may prove to be the last independent ruler of the Drisite dynasty—a dynasty which dates back no less than some 1,200 years.

According to the chronicler, Ibn Khaldun, in 788 Idris, a great-great-grandson of Hassan (who was a son of Ali and of Fatima), had fled from Arabia, and, passing around by the Desert of Sahara, had come up to Tangier, where he was amicably received by the Berbers. Ed Dris or Idris, as it is pronounced, was fleeing from the dread of death at the hands of the Khalif El Mehdi.

It may seem rather a far cry from circumstances connected with the present day to go back so far as to this date of 788; but, curiously enough, no less than four of the chief personages who were concerned either in my capture or in my subsequent release were all descendants of this very Idris: First, the Sultan of Morocco, who paid the indemnity of $70,000 in order to secure my release; secondly, the young chereefs of Wazan, who brought up a relief expedition to

*The Turkish form is Abdulaziz, the Arabic is Abd El Aziz.

bring me supplies and who remained with me; and, thirdly, Raisuli, who was my captor.

The fact which I gave you here concerning this Idris and a good deal of the other matter is taken from the first volume of M. De Slane, page 24, of "Le Tresor de Chronologie du Moyen Age de Maslatrie," which is one of the most complete and celebrated chronicles which we have. It had pleased me to place myself thus, as it were, on the boundary at Tangier between our Western life and the life of the East—of the old world. But it was one thing to look, as it were, from one's windows out upon conditions which were precisely like those of the time of Idris, or even farther back; it was quite another thing to be snatched away from one's home and friends and family and to be plunged into the lawless condition of such a period.

THE LAND OF THE EXTREME WEST

El Moghereb is the name by which Morocco is known in native official documents. The inhabitants, however, speak of their country as "El Gharb." This term, "El Moghereb," signifies the land of the extreme west—that is, of the extreme west of the African Continent. It is probably derived from the verb which means to *sink,* or the sunset; so that in English it is sometimes described as the sunset land. The varied domains of this vast territory—almost as large as either France or Spain—are protected from the desert winds which sweep over Algeria and Tunis by a barrier of snow-capped mountain ranges—those of the greater and of the lesser Atlas, forming, as it were, a huge backbone. And just opposite the Straits of Gibraltar a spur strikes out and runs down at right angles to the seacoast and terminates in an abrupt eminence known to the ancients as Mount Abyla and to the Arabs as Djebel Moussa. The range itself is known as the Riff Mountains, and offers a splendid barrier or defense toward the east—that is, toward Algeria. It was among these mountains that we were taken prisoners.

The population of Morocco has been variously estimated at from so trivial a number as four million up to seventy million; but, as none of our authors who have made these statements have been able to base their reports upon any census, it is the vaguest kind of guesswork. The country gives to strangers who do not know it the impression of being very sparsely populated, because the natives avoid the neighborhood of the highroads. This is due to the continual passage of troops, and because the inhabitants are subjected to what is called the system of supplying *"moona"*—a system which enables travelers to procure letters from the government. These letters entail upon the inhabitants of the roads the necessity of supplying food, not only for the travelers themselves, but for all their escorts; so that it is a very serious tax; and the natural consequence is that the inhabitants avoid the neighborhood of the highroads as much as possible. Therefore the travelers going back and forth see very few inhabitants in the few villages that still remain. But people who know the country better—the merchants and others who travel in the country itself—realize very soon that it is much more densely occupied than would appear from the highways.

THE BERBERS—THEIR ANTIQUITY

About two-thirds of this population are probably Berber or of Berber descent. These Berbers are the aborigines. They are a purely white race and a very energetic and vigorous people. The term "berber" itself is possibly derived from the Semitic root *ber,* which means land. Therefore "berber" would mean "land of the land;" or it may be simply a corruption of the Greek term "Barbaroi," applied by the early Greek navigators to foreigners in general, but more especially to all this coast along the southern shore of the Mediterranean. Hence we have

the nomenclature of the Barbary States, including Barka, Tripoli, Tunis, Algiers, and Morocco.

These Berbers antedated Phœnician, Carthaginian, Roman, Gothic, Byzantian, and Arab occupation by centuries upon centuries; it is probably one of the oldest races; and there are certain ethnologists at the present day, at the head of whom is an Italian writer named Sergi, who maintain that the theory of those successive invasions of Caucasians, about which we have all read, and which are generally believed to account for the origin of the races of southern Europe, did not furnish the main part of the population of the Mediterranean basin, but that the latter was derived from these Berbers, a white race which has many resemblances to the ancient Etruscans. They are quite like the pictures also of some of the ancient Egyptian dynasties.

THEY HAVE ALWAYS WITHSTOOD SUBJUGATION

These people have always been opposed to any attempt to bring them under control, and they have never been kept in subjection by any of these successive governments for any great length of time. Their desire is never to recognize any more authoritative control than that of their own village elders. It is from this race that the two great sects of the early church of the fourth and fifth centuries, known as the Donatists and Cercumceliones, are descended. These were really a sort of Christian nihilists, a sect which swept away many of the towns and villages of the Roman senators—a destruction which was finally completed by the great Arabic invasion which swept over much of that country, and which seems to have been itself on very friendly terms with these Berbers.

The Berbers, as you are all very well aware, joined the Arab invaders and formed a large contingent of the Saracen tribes who overwhelmed the Gothic kings of Spain. They did not speak of themselves generally as Berbers; they called themselves Schleuh, and described the various dialects of their tongues as of the Schilhak language. They could not even understand or communicate with the Arab tribes without an interpreter. Some of them learn Arabic, but many of them cannot communicate at all with their fellow Arabian laborers.

The name "Morocco" can be traced to the Roman designation of Mauritania, the natives being called in Spanish "Mauros," "Moriscos," and finally "Moros," and hence in English "Moors." The word "Morocco" may also be an effort at approximation to Marekshe, the southern capital of the country which we know as Morocco City. Whatever may be the origin of the term "Berber," these people speak of themselves as "Schleuh."

When the successive Arab invasions, beginning in 711, broke upon the country (that was in the year 200 of the Hegira) this Berber population was ultimately driven by the Arabs from the plains and from the richer valleys and forced to take refuge among the Atlas Mountains; and in these mountain ranges they have always remained, a thorn in the side of the Arab rulers and a great menace and danger to the people of the lowlands, whenever the central authority was weakened by a disputed succession with a feeble Sultan at the head of affairs.

THE JEWS ARE AN IMPORTANT FACTOR

There are two other important factors among the population—the Jews and the negroes. The Jews are mostly exiles from Spain and Portugal, having been driven out after the Moors had been expelled from Spain. The Jews were driven out by the Inquisition, and a great many of them came over to Morocco and settled there. Others went as far east as Turkey. Still others visited other countries. Those who settled in Morocco were almost all confined to a special quarter of the towns, entitled El Mellah. This word Mellah means salt, and it

comes from a very curious feature in the customs of the country. Whenever rebellions break out—and they are very frequent occurrences—the soldiers in Morocco have instructions to bring in as many heads as possible. These heads have to be preserved and salted, and nobody likes to execute this commission; consequently the Jews were compelled to undertake this revolting task.

THERE IS NO DISTINCTION OF COLOR LINE

Another element were the negroes from Soudan, from which the famous Bokhari guards were recruited. Some of these negroes occupied very high official positions. I may say, as it is an interesting question to us here, that after the death of the late Sultan of Morocco there was an interregnum of six years before the young Abd El Aziz was old enough to take the reins of power. During that time a negro regent named Ahmid ben Maussa governed, who was one of the most able rulers Morocco has ever had. He kept the country in perfect order and was very much respected by all who knew him.

There is no distinction of color line in Morocco. The question is simply what is a man's capacity. It does not matter what the shade of his complexion is in the least. The gentry of the country are mostly drawn from those Moors who were expelled from Spain, and who returned to Morocco. All those who have any descent from the Prophet are called Chereefs. This word is derived from the root "Churf," which means to grow old—to grow old with honor. To say that anything is *churfa* means that it has become distinguished through time and circumstance. So that this is a sort of title of nobility—religious and secular.

THE BETTER FAMILIES

Some of the better families still claim that they preserve the keys of the houses occupied by their ancestors in Granada, Cordoba, and Toledo and the other Spanish cities. The women of some of these families at the notheastern capital, Fez, wear embroidered upon their high scarlet head-dresses a golden key, a sort of symbol of this descent. I know some of these families who claim to still possess these keys, but I have never seen any of the keys. One consequence of the apparently long residence of the ancestors of these particular families in Spain is the extraordinary fairness of the complexion of a great many of their descendants even at the present time. For instance, the minister of foreign affairs at Tangier, Hadj Mohammed El Torres, whose name you sometimes see in the papers, is as fair as any person in this room, and, as his name indicates, he is a descendant from one of these very families from the city of Tetuan. The explanation of this fairness of complexion is supposed to be the well-known fact that many of these Mohammedan chieftains of Spain intermarried with Gothic women. They are very proud of this and strive to keep it up and not to cross their blood. Consequently strangers who visit Morocco are very much astonished to find so many absolutely white men.

THE SULTAN HAS NEVER ACKNOWLEDGED ALLEGIANCE TO ANY OTHER POWER

The Sultan, as you all know, is an autocrat. Neither he nor his ancestors have ever acknowledged allegiance to any other power. The confusion which exists on this point among so many people in this country is due to the fact that the neighboring province of Algiers was for a long time under the control of Turkey and was governed by Turkish beys. But the Sultan of Constantinople, who greatly desired to extend his control over Morocco, was never able to do so on account of the opposition of the dynasty and especially the strong opposition of the Berber tribes inhabiting the range of hills between Morocco and Algeria. They never allowed the Turkish government or its representative in Algeria to get a foothold in their own territory.

The authority of the Sultan may be described as somewhat tempered by the Ulema. These Ulema are the "learned in the law." The name comes from the verb "elm" or "ulm," which means "to learn." They, together with the Chereefs and the Marabouts, are really the only authentic representatives of popular opinion in a country where there is no press. One of the greatest mistakes that this young Sultan committed after the death of that great negro regent was that he paid no attention to the opinion of these Ulema. He has had occasion since to greatly repent of this error.

THE LAWYER IS ALSO A CLERGYMAN

There is no distinction between professors of law and theology in any Mohammedan country, for the reason that the whole code is extracted from the Koran itself; it is based upon Koranic precepts or on the various Hadiths. The Hadiths are the traditions, the sayings, attributed to Mohammed or to his immediate successors. From this work we get the whole body of the law; so that any one who is a member of this class of the Ulema or who, in other words, has taken his degree at the university or at the great mosque of Idris may be either a cleric (or divine) and go into the mosques and preach, or he may enter the mosques to devote himself to education as a professor. It all depends upon his power to attract classes. He does not have to ask permission from any authority, but can take up his quarters and hold forth, as lawyers and clergy all pass through exactly the same education and can occupy at pleasure one post or the other. Indeed, my family solicitor at Tangier was an incumbent of the principal mosque there and read the service regularly every Friday. He was a capable gentleman and, so far as my experience with him went, a very honorable and straightforward character, with a good deal of capacity.

Now, unfortunately these traditions do not come to the people directly. They have gone through the hands of a series of commentators, from whom are derived the different religious sects, of which there are four very prominent ones. They are called the Hanifi, the Chaafi, the Hanbali, and the Malaki. This last is the prevalent sect in Morocco. The only Mohammedan countries I know which are followers of this particular rite, which is the most narrow of all the sects of Mohammedanism, are Morocco and Afghanistan in Asia.

To come back to the situation in Morocco, I should tell you a little about the peculiarity of the government. The government functionaries, from the Sultan down to the lowest grades, form what is called the Mekhazen, which is derived from a verb "hzn," meaning "to bind."

I believe the word was first applied to that portion of the land or of the crops which, according to tradition, was set aside for the government and over which administrators were appointed. As the Sultan of Morocco and his cabinet ministers were the chief administrators of this treasury or magazine, they are the beneficiaries of the term and they are called the Mekhazen. The government of Morocco is always spoken of as El Mekhazen and the officials, from the Sultan down to the guards and minor employees, are termed Mekhaznia. Curiously enough, from this word Mekhazen, meaning "a warehouse," we probably get our expression "magazine."

The Sultan resides half the year at Fez, founded in 807 by the same Idris, and the other six months at Marakche, founded in 1130, during the reign of Abd El Mumin, the monarch who built a great tower at Rabat and who also played a great role in Spain. Some of the principal Saracenic buildings there were erected under the influence of his reign.

THE DIPLOMATIC CAPITAL

Tangier became the diplomatic capital on account of the extreme inconvenience

to the foreign legations, with all their ministers and family establishments, of being obliged to follow the court in its continual migration from one capital to the other, across the country where there are no roads and many dangerous rivers to be traversed. Therefore the foreign consuls who would not have been safe in the interior remained at Tangier, and the Sultan appointed officers and delegated ministers of foreign affairs and of finance to treat with them at Tangier. Hence it is only occasionally, when some question of great importance has to be negotiated, that special missions are sent to the capital where the Sultan happens to reside. It is a very great affair, the departure of these special missions with their numerous guards. Great preparations are required, and it is quite an imposing sight to see the minister with his secretaries and attachés and his own legation guards, together with the imperial escort and standard in front, leaving Tangier on one of these expeditions.

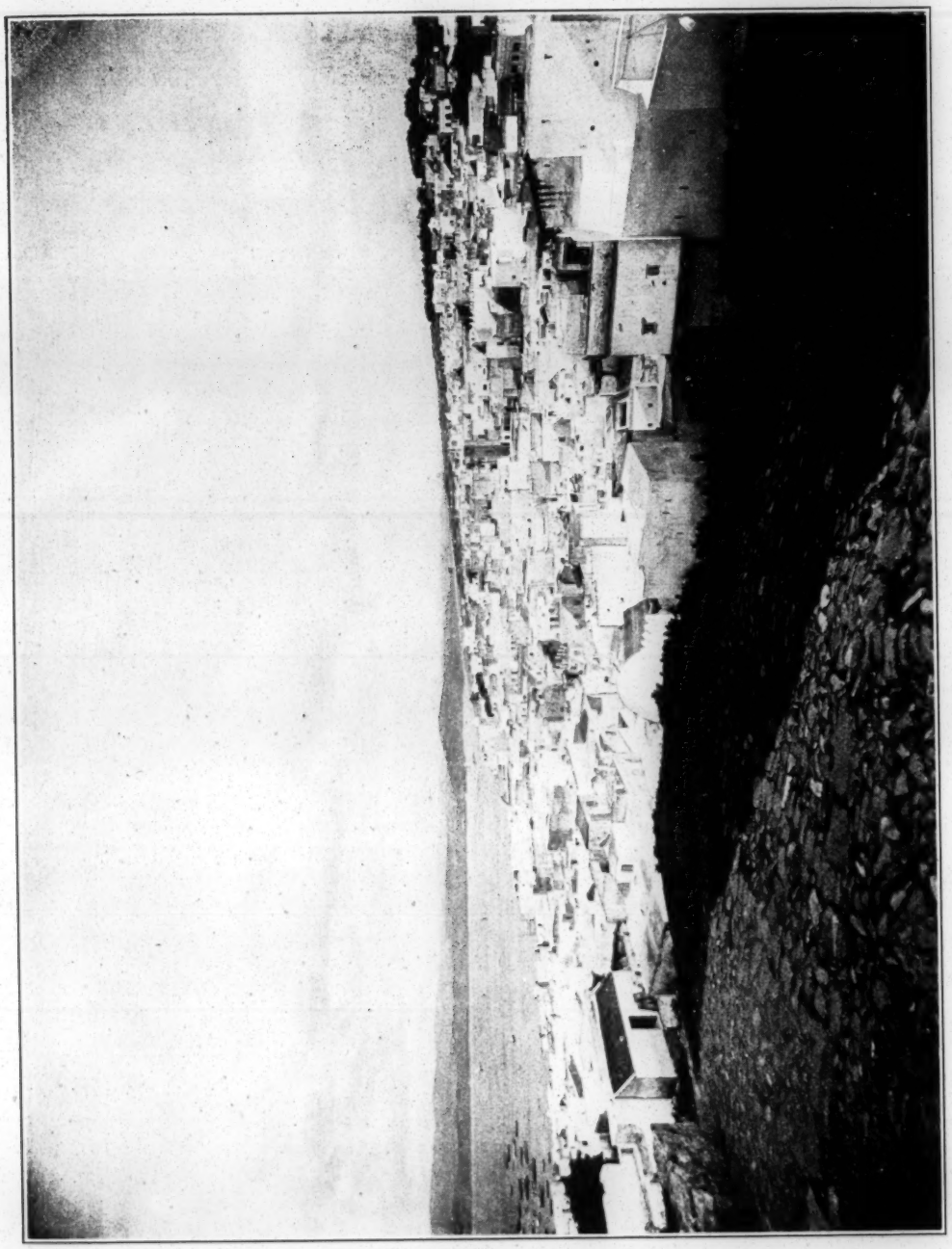
The name by which Tangier is known to the Arabs is Tanja. Tanja means clay. It also means a little clay vessel for cooking that the natives employed. Curiously enough, the classic name was Tingis, which is not very far removed from the term Tanja. I suppose we got our expression Tangiers from an attempt of the English geographers to make the name conform to Algiers. Now Algiers itself is quite a misnomer, because the Arabic name for Algiers is El Gezire, meaning the city of the isle, from an island off the coast. They called the province itself "Ber El Gezire," the Land of the Island. The Roman name of the province about Tangier was Tingitania, established during the reign of Emperor Claudius.

TANGIER AT ONE TIME BELONGED TO ENGLAND

In 1580 Alphonso of Portugal occupied Tangier, and in 1662 it was ceded to England as a part of the dower of the Princess Catharine Braganza when that princess married Charles II of England. Another part of her dower was Bombay, which was the origin of the great Anglo-Indian Empire. The Moors were just as well armed as the British in those days, and, owing to the improvidence of Charles II, they were a good deal better fed, because the garrison which occupied Tangier was left so unprovided with food that upon some occasions the men were obliged to sell their armaments and shoes and clothes in order to get a little money to buy bread. In those days the arms of the Moors were probably superior to those of the English, and the latter were not able to hold the place long, owing to the constant attacks of the Moors. There are, however, some very well-known names that appear on the register during that English occupation of Tangier. We have the Earl of Teviot, Lord Dartmouth, Pepys, notable for his diary, and the Rev. Launcelot Addison, the father of Charles Addison, the writer; and in a work which is extremely interesting, by Lieutenant Colonel Davis, "The History of the Second Queen's Royal Regiment" (now the West Surrey), it is stated that John Churchill began his military service in Tangier under the command of Colonel Kirk, who played such a sanguinary role in the Cromwellian wars of England during Jeffreys' sanguinary assizes.

In reading John Morley's life of Oliver Cromwell I found to my great surprise that one of the regicides, General Fleetwood, who married Oliver Cromwell's daughter, was confined in the Moorish castle at Tangier; and there is a letter on record from his wife petitioning that he might be removed to some establishment in England, where she might provide him with the necessities which his station required. This particularly interested me, as my youngest stepson, who has frequently resided with me in Tangier, is a direct descendant of this same General Fleetwood.

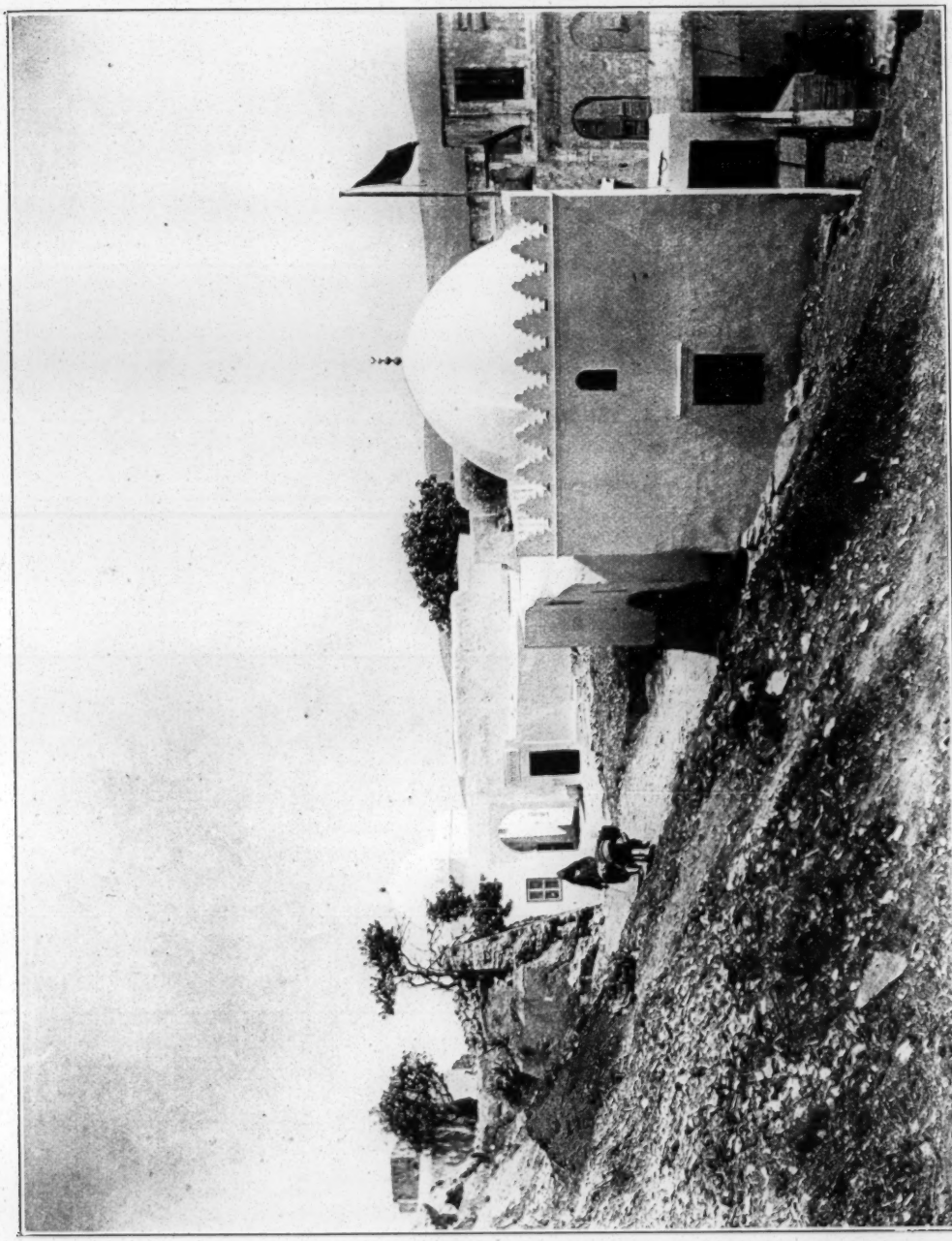
Another little incident that amused me



View of Tangier, with the Bay Showing to the Left of the Spectator

Dar El Beit, or the Treasury in the Fortress at Tangier

To the left the Kalifa or Governor's lieutenant administers justice, while the arched doorway at the end of the street gives access to the Governor's Palace, where the Basha himself sits in judgment



Saints' Shrines at Tangier

A Moorish Saint of Most Unsaintly Character, 6 feet 5 inches in height

A Peasant Berber Woman with Her Child, coming into Tangier along the Beach, Probably from the Province of Angera

Market Day. Pots and Pans!

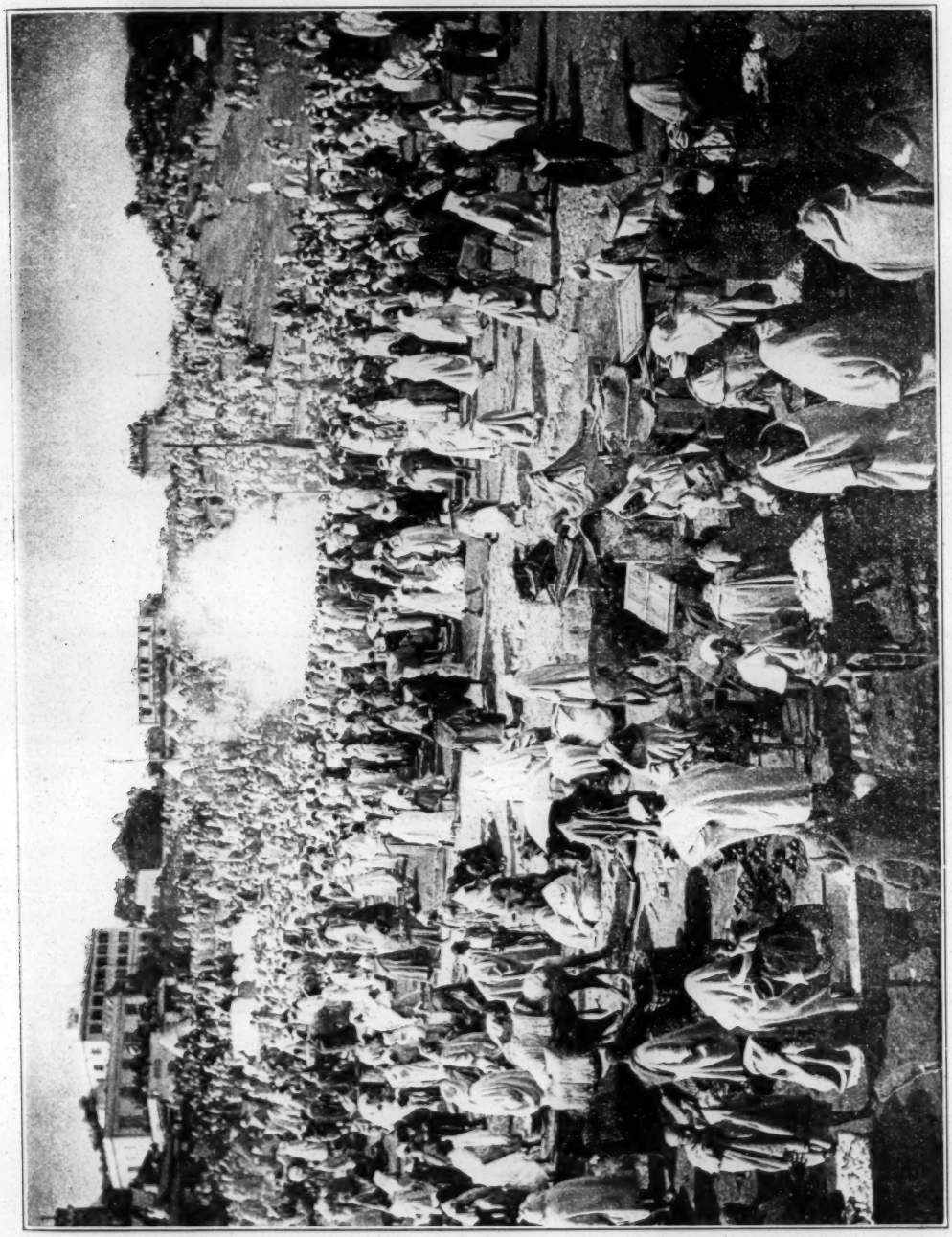
As this scene appears today, so it has been, without change, not merely during centuries but for ages past. The Moorish name Tanja (Tangier) signifies the clay from which these articles are made by the potter

The Main Street of Tangier or the Ciagreen, *i. e.*, the Street of the Silversmiths

With the tower of the principal Djama or Mosque, whence the call to prayers is issued at dawn, midday, aud eventide

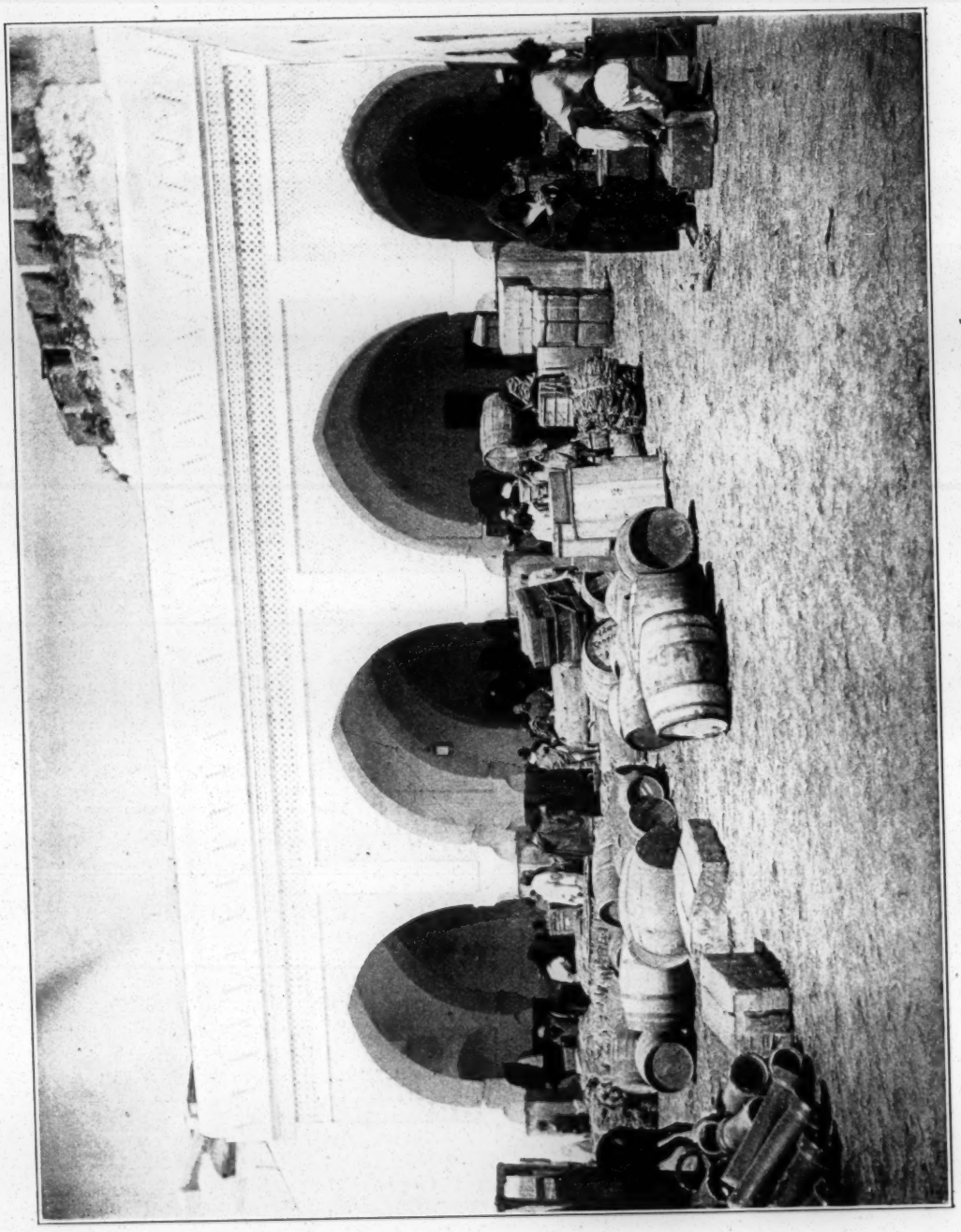
The Gateway of Bab El Fhas, with the Kasbah or Fortress of Tangier in the Background

It is market day and the Soko or market place is crowded by vendors and purchasers from the neighboring districts

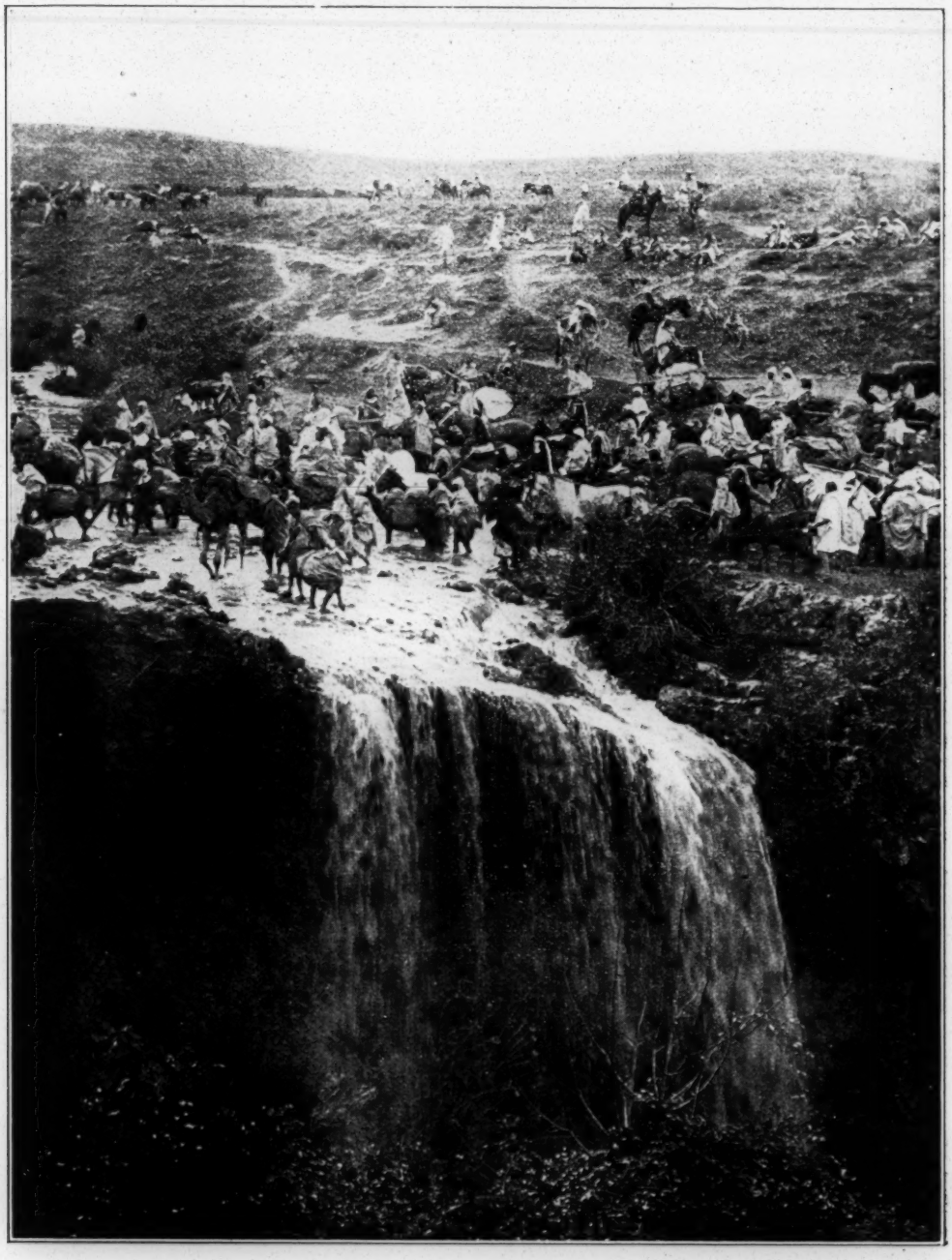


Laab El Barud or Powder Play upon the Soko or Outer Market at Tangier

The Villa de France Hotel is seen on the highground to the left, while the British Legation further off is visible directly above the smoke from the discharge of native arms in the center of the picture



The Entrance to Tangier through Arches of the Custom-house



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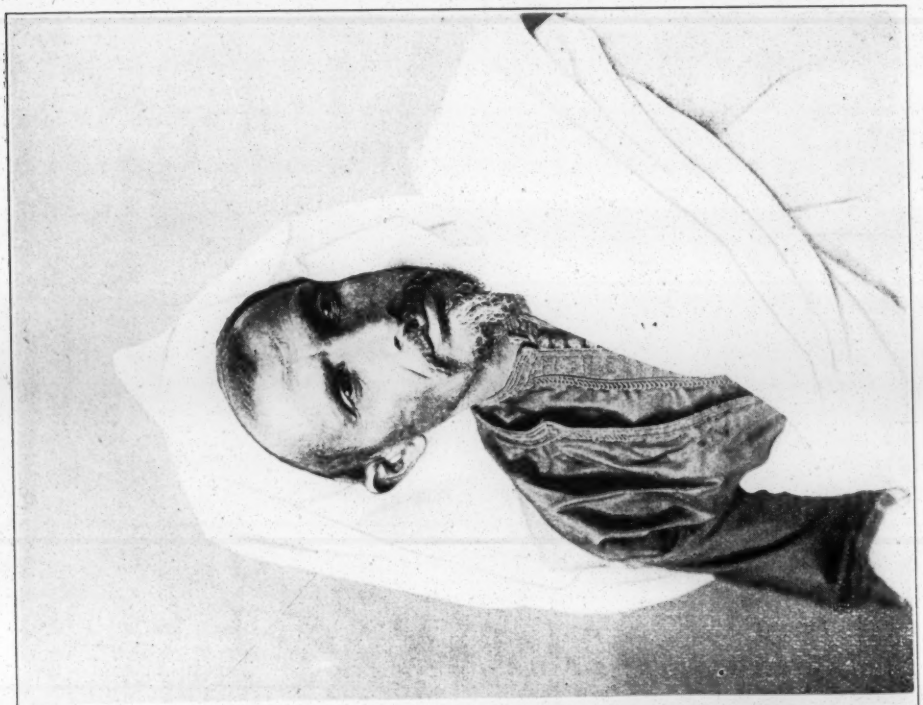
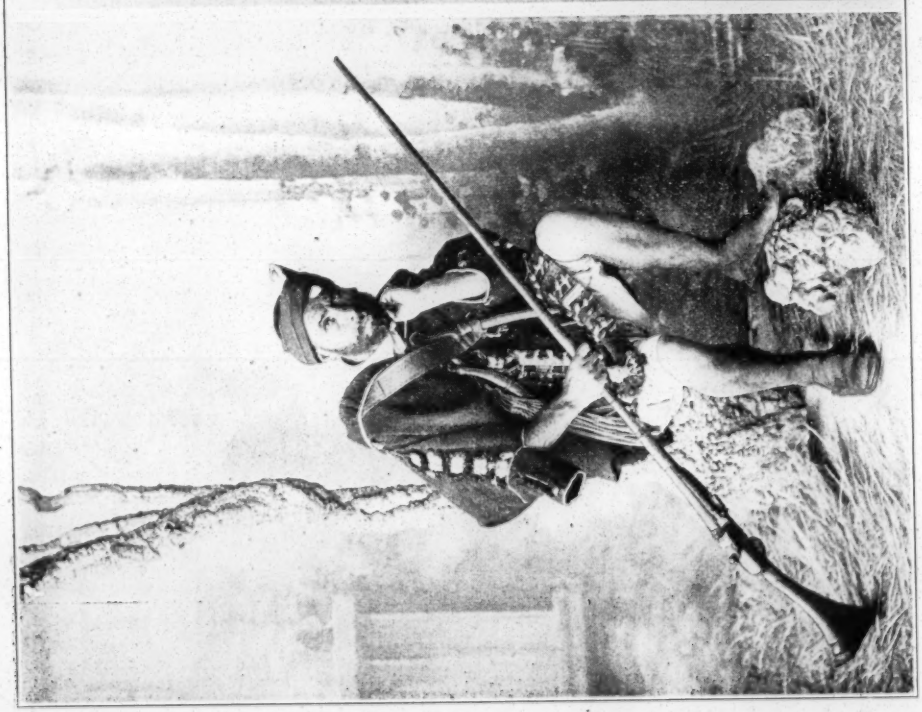
Crossing a Stream in Morocco, near Fez, one of the two Capitals

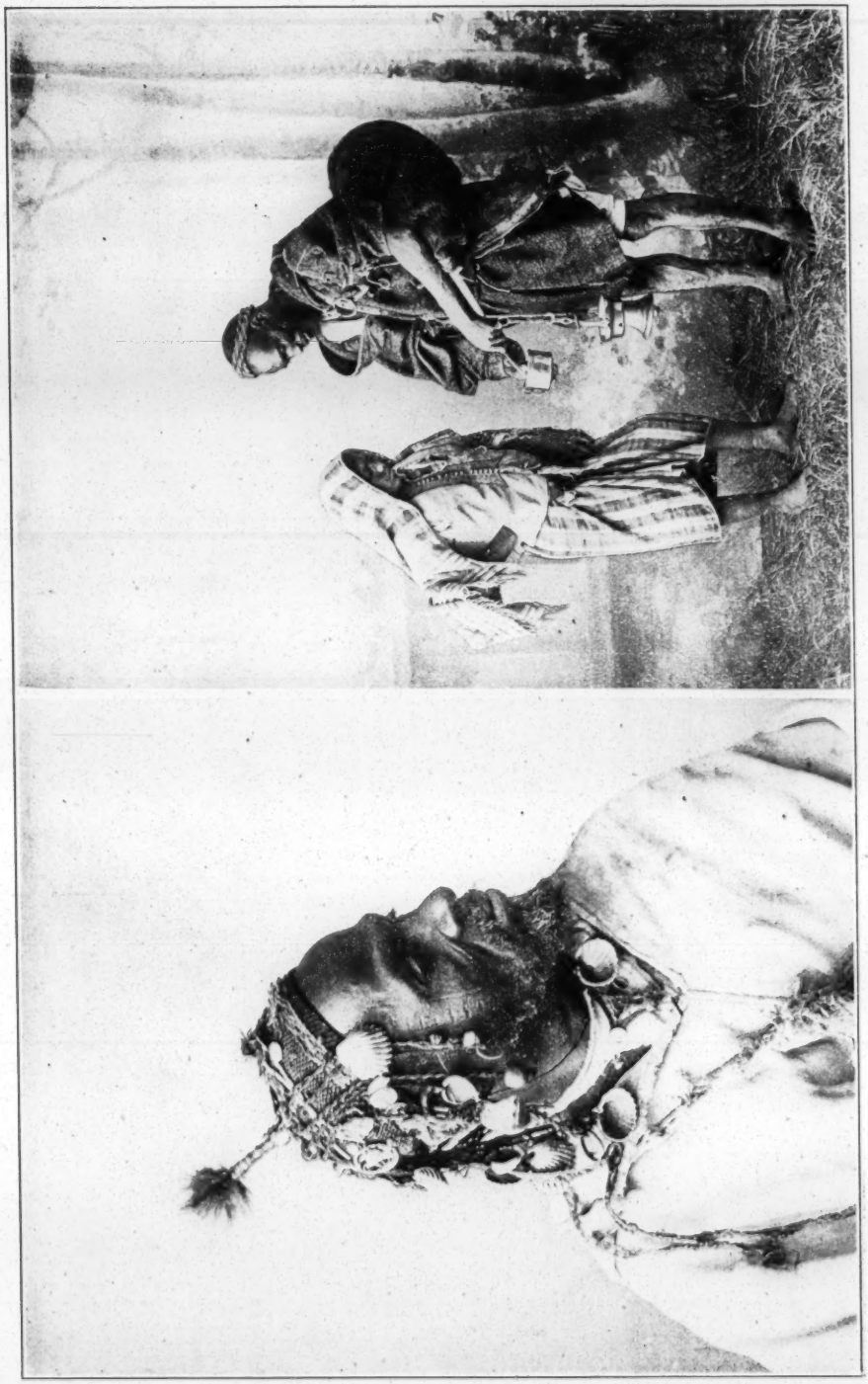
A typical view of the country



A Typical Moor of Tangier



One of Raisuli's Men—a Berber



Peasant Girl and Water Vendor at Tangier—Negroes

A Soudan Minstrel

Photo from David G. Fairchild

A Type general throughout Morocco and its Neighbor, Algeria

Photo from David G. Fairchild

A Moorish Belle

Aidonia, the Summer Residence on the Spartello Headland of Ion Perdicaris

The scene of his capture by Raisuli. The house faces the sea, which is obscured in this picture

was that on coming here on the steamer last spring I was told on board ship that there was a family in New York called Tangier Smith; that the founder of this family had been one of the English officials at Tangier during the English occupation of those 22 years, and that the family had always been known as Tangier Smith; that the official in question returning to England had secured a grant of land in Long Island from King Charles, and had thus helped form one of our oldest settlements in colonial times. I was wondering whether my informant was not inventing all this for the sake of telling a good story; but when I went to one of the hotels in New York the very next name to mine on the register was Mrs. Tangier Smith.

Up to about 1839 the naval power of the Sultan was supposed to be equal to repelling any aggression by any of the greater maritime powers, and some of the minor European states actually paid an annual indemnity to the Sultan of Morocco in order to protect their flags from aggression by the Salee rovers.

The Sultan fitted out these pirate ships to go forth and capture vessels and bring them into port and hold the crews for ransom. If they were not ransomed the crews were sent up in the interior to work in gangs.

The suppression of the rovers was largely due to the attitude taken by the United States, together with other powers like France and England, and to men like Decatur and Stockton.

View in the Grounds of Aidonia. The Flower Garden

THE ENTRANCE OF FRENCH INFLUENCE

On August 6, 1844, the French bombarded Tangier. This was a retaliation for the protection which the Moorish government had afforded the Emir Abd El Kader, who had taken refuge with his forces upon Moorish territory when he was pursued by the French. In 1860 a Spanish force under General Primm marched up from Seutta to Tetuan and took that town after six weeks of severe fighting. Afterward the Moors recovered the place by means of a heavy indemnity; but they had learned one great lesson, viz, that the wild charges of their own cavalry were helpless to protect them against troops who were supported by modern field artillery. This event led to an extraordinary change in the attitude of the Moorish government and people toward foreigners. However, this more amicable behavior of the natives was not due to any liking for us, but rather to the fear entertained of their own authorities, who, under pressure from the foreign consulates, punished with extreme severity any aggressions.

The natives soon learned to value the intervention of foreigners in their behalf, and even sometimes paid a considerable price for such protection against the cruel exactions of their own governors. Not only did foreigners enjoy a remarkable security, at least in the neighborhood of the coast, but their position during the entire reign of Umlai El Hassan might be described almost as that of privileged guards of the nation—a position which I regret to say was often abused by officials and especially by the native protégés of the various consulates.

THE BEGINNING OF DISORDER

In 1894 Umlai El Hassan died. This Sultan was perhaps the ablest ruler Morocco ever enjoyed, and was as remarkable for his personal appearance as for his courteous manner and signal merits. His young son, Abd El Aziz, nominally

The British Consul at Tangier, to the left, and to the right Kaid Sir Harry Maclean, late Commander and Military Instructor of Sultan's Forces

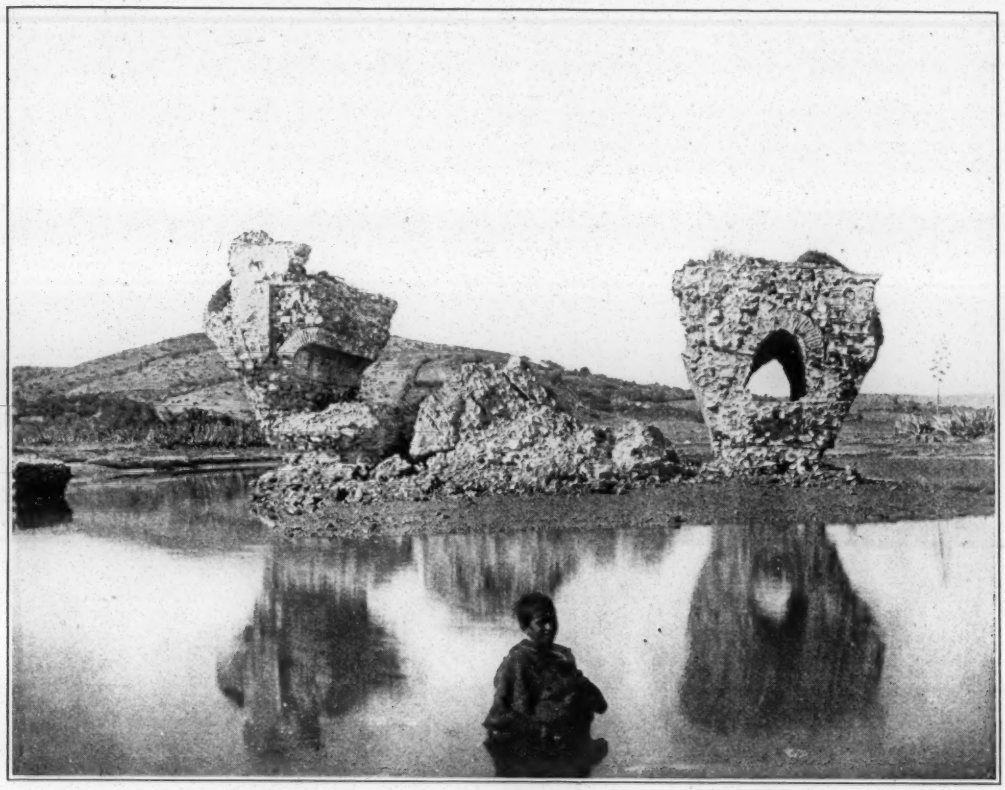
succeeded to the throne upon his father's death, but did not assume the reins of power until the decease, in 1900, of the Great Vizier, Ben Hamed Ben Mousa. A year or two later an adventurer known as Gilali El Zarhmni, an alleged elder brother of Abd El Aziz, and many of the Berbers in the neighborhood of Fez, rallied around this Pretender and even threatened Fez itself. For a short time the Sultan's troops were so aroused that many of them deserted with their arms to the enemy, and the Sultan himself barely escaped capture. Since this experience Abd El Aziz has not ventured to leave Fez, excepting for a few weeks on a single occasion, lest the city should open its gates to the Pretender.

The weakening of the Sultan's hold upon power was followed by a marked alteration in the attitude of the natives toward foreigners—Europeans or Americans.

It was evident that the singular immunity and advantages we had so long enjoyed no longer existed, and it became a question as to whether it was wise to remain in the country. There were, however, many reasons why I hesitated to abandon my considerable interests in the country. I was at the time president of an international commission charged with the administration of the town of Tangier; nor did I imagine that I myself would be exposed to any immediate danger, much less that I should be carried off as a hostage by the Berbers, or that the squadrons of our navy and the orders of my release here in Washington would become factors in the immemorial struggle between the Berbers of El Moghereb and the Sultan of Fez and Morocco.

THE SURPRISE AND CAPTURE

We had moved up two days before this startling event to Aidonia, our summer residence, on the Spartello headland about 5 miles from Tangier. The house which we had here erected is an unpretentious villa overlooking the entrance to the Straits of Gibraltar and surrounded by grounds some 300 acres in extent, embracing many varied features of woodland and of precipitous rock. This lovely locality has, however, been sadly spoiled for us by the alarm and insecurity caused by the Raisuli raid.



Remains of a Roman Bridge not Far from Tangier

The memory of that evening is indeed associated with an ineffaceable sense of horror. We had gathered in the drawing-room directly after dinner, when we were startled by loud screams from the servants' quarters. Followed by my stepson, Mr. Cromwell Varley, whose wife and two daughters, just home from school at Geneva, completed, with Mrs. Perdicaris, our family circle, I rushed down a passage leading to the servants' hall, where I came upon a crowd of armed natives.

Even then we did not realize our danger, but thought these intruders might be a party from a neighboring village. Our night guards were supplied from this hamlet, and we supposed that they, like ourselves, had rushed in to learn the cause of the uproar, which we, at the moment, attributed to some renewal of a quarrel that had broken out on a previous occasion between a young German housekeeper and our French chef de cuisine, when the latter, irritated by some insulting allusion to the French defeats at Metz and Sedan, had attacked the housekeeper, when, as now, we had been startled by her screams.

As I turned to inquire of these natives who crowded about me as to what had occurred, I saw some of our European servants already bound and helpless and, at the same moment, we ourselves were assailed by these intruders, who struck us with their rifles. At the same instant

our hands were roughly twisted and bound behind our backs with stout palmetto cords that cut like knives.

Varley, who made a fierce resistance, was handled with more violence. Indeed I thought the rifle blows would split his head, while his hand was cut to make him let go his hold upon one of the gang, whom he had liked to have strangled.

At this moment the housekeeper, hearing our voices, rushed across the hall from her dining-room, where she had locked herself in, and, just as we were driven out of doors, we saw a blow aimed at her head and she fell to the floor. This was the last we saw, then, of any one in the house where I have never since set foot.

Once outside, our assailants endeavored to drive us down to the stables, but we managed to make our way toward a guard-house, where a couple of government soldiers were stationed rather as gatekeepers to attend visitors than for any purpose of defense.

A Group of Camels Passed on the Way to Tsarradan. The Site of Our Captivity

RAISULI

By a lamp in front of this building we saw our guards, our gardeners, and other native servants under cover of the rifles of another party of mountaineers, while a little apart stood their leader, a man of fine presence, attired in the handsome dress worn by the native gentry. One of my men was reproaching this personage bitterly for this unprovoked aggression.

The leader of the mountaineers raised his hand and, in low but emphatic tones, declared that if no rescue were attempted nor any disturbance made, no harm would befall us and in a few weeks we should be safely back among our people, adding, "I am Raisuli! the Raisuli!"—this, as I afterward discovered, being his clan appellation, since this chereef, or native nobleman, is known among his own followers as Mulai Ahmed ben Mohammed, the Raisuli.

On hearing him declare his name I felt at once that the affair was possibly more serious than I had hitherto anticipated, since the presence of this insurgent chieftain meant more than a mere summons to surrender any money or valuables in the house, and that some political object had probably dictated this attack—one which had been so unexpected and suddenly executed that neither our guards nor our grooms and gardeners, nor the Spanish workmen employed upon the estate, nor we ourselves had been able to make any defense, all of us having been simultaneously attacked and overpowered before we were aware of any impending danger.

Raisuli had indeed been reported to be on the warpath for some time past, but as his operations had been confined to outlying native villages or to the smaller towns, no one imagined he would attack any one in the immediate neighborhood

A Waterwheel Driven by a Donkey on the Road to Tsarradan. Raisuli's Stronghold

Notice the earthen jars and the blindfolded animal

Encampment of Migratory Shoemakers Outside of Tangiers

These shoemakers live in the mountains and every year come down to camp for a month here while they make and repair the shoes of the people

of Tangier—where I myself, as president of an international commission that administered the affairs of the town, was in a position to requisition by telephone the entire available military force.

Approaching him, bound as I was and in evening dress, I said to him in Arabic, "I know you by name, Raisuli, and I accept your safe conduct, but we cannot go with you thus. We must have our overcoats, hats, and boots."

"Which of your servants shall I have released to return to the house for what you require?" replied Raisuli.

I selected Bourzin, the younger of the guards, on duty that evening. On indicating Bourzin, his bonds were cut and he was released; but as he did not immediately reappear, Raisuli became impatient; still he allowed another of my servants, a Spaniard, to also be released, and the latter quickly executed his commission. We had not time, however, to put on our boots before we were hurriedly made to mount.

Several of our horses had been brought up from the stables, but either because it was feared that Varley might escape or because he had been wounded, he was put upon a mule which the mountaineers had brought with them, while I was allowed to select which of my animals I would

Moorish Women at the Spinning-wheel Waited on by a Slave

ride. As I apprehended a long journey, I chose the youngest and most spirited of my horses.

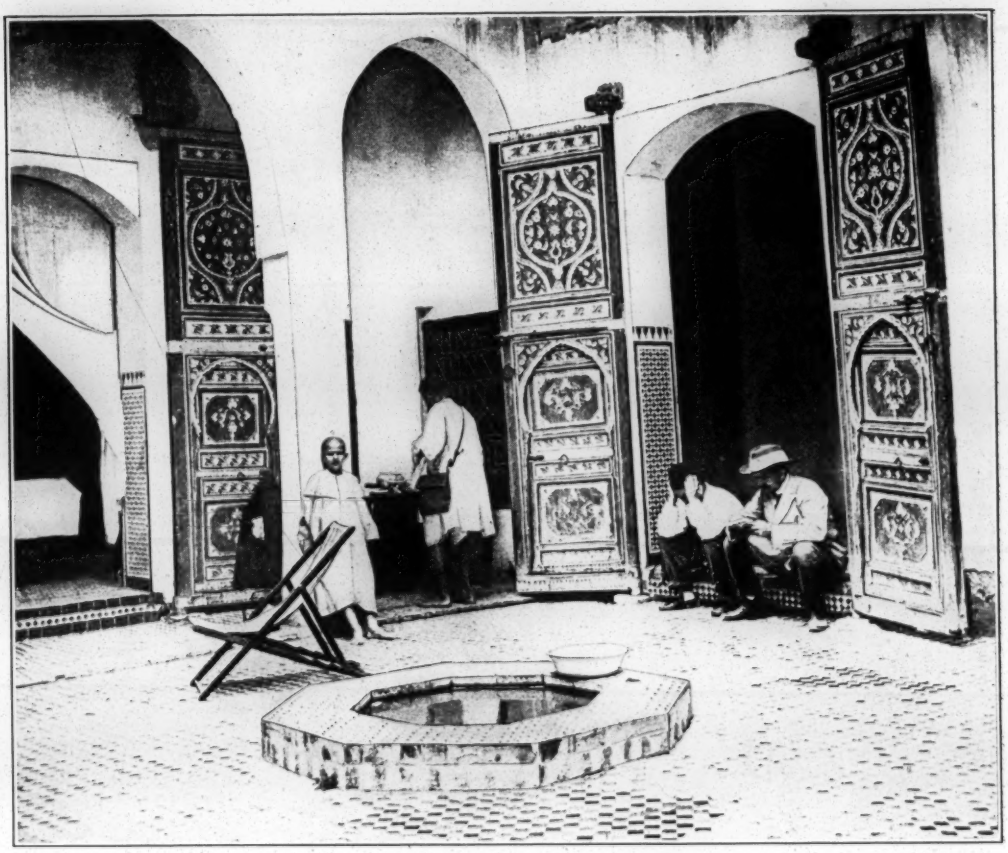
Before we mounted our hands were freed, upon giving our parole that we would not endeavor to escape. This was an immense relief, for those palmetto bonds cut into the wrist, while the constrained position of our arms amounted to torture.

We were not, however, allowed to hold the bridle ourselves, but were led off by the mountaineers, whose rough handling threw my horse into such a frenzy that it was with difficulty that I could keep my seat.

Just as we were starting, Bourzin reappeared and volunteered to accompany me, to which Raisuli assented, and this attendant was also allowed a mount.

Two of the mountaineers clambered upon Varley's horse, a big chestnut, which was not saddled, while the saddle which had been hastily placed upon my horse was one that had been cast aside and the girths were rotten.

As I learned afterward, this selection was due to a mistaken attempt of one of my grooms to save our saddles. He did not realize that they were required for our own use, and when he had been ordered to produce the saddles, had thrown this one to the mountaineers, declaring that the good saddles were all under lock and key at the house—a mistaken zeal, which cost me, later on, a serious accident.



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Courtyard of a Moorish Residence in Fez Showing Decorated Doors

The decorations which resemble inlaying in appearance are painted on wood

THE EXPERIENCE OF THE LADIES

Thus we were led off along the dark avenue beneath the overhanging branches of the trees.

"At least," I thought to myself, "At least the ladies know nothing of this horrible misadventure!" since I pictured them as still awaiting in the drawing-room our return from the servants' hall, to explain the uproar and the screams of the women.

Very different, however, had been the alarming experience of the other members of the family during the few minutes which had elapsed between our leaving the drawing-room and our departure with the mountaineers. As we learned six weeks afterward, the ladies had presently followed us from the drawing-room, but when they reached the servants' hall we had already been driven out of doors.

As Mrs. Perdicaris endeavored to join us, one of the mountaineers, seizing her, threw her violently backward, down a half flight of stone steps onto the pavement, while Mrs. Varley was pitched on top of her.

The women servants, who alone had not been bound, assisted the ladies to rise, and one of the women rushed past the mountaineers to the telephone, and before these savages realized her intention she called up the central office at Tangier, telling them of the attack and of our capture. Before she could say more she was torn from the instrument by the angry natives.

At the same moment the screams of a pretty native servant struggling with the men, who were dragging her off, aroused my wife, who, despite the fact that she was seriously hurt from her fall, rushed to the woman's assistance and Ayesha's cowardly assailants, fearing Raisuli's displeasure, hastily retired, balked of their proposed prey.

Mrs. Perdicaris was then herself assisted to the front hall opening upon the portico or pergola, where she came upon Bourzin. Instead of bringing us our things, Bourzin stopped to reassure my wife, inventing a statement to the effect that I knew the leader of the band and had in the past rendered Raisuli a great service, and that we were now amicably coming to some arrangement, but should any disturbance be made, that all of us, both the family and the servants, might be killed.

As my wife listened she heard my voice from without as I addressed Raisuli and, noticing that I did not speak in tones either of excitement or alarm, she concluded that Bourzin was telling the truth; consequently she waited near the door for my return, and in the meantime Bourzin slipped away, unnoticed, to rejoin me.

THE MARCH BY NIGHT

Needless to say the ladies waited in vain for our return, and when at last they ventured out onto the pergola all was silent. We had disappeared.

As for ourselves we were led rapidly along the avenue leading away from the direction of the town, our horses being forced over the dry stone wall which encircles the property and driven along by many a blow from the rifles of our escort, as the men dragged the unwilling animals over rocks, through the underwood and brambles, and across the numerous watercourses, down toward the plain of Bubana to the west of the town.

How different the familiar locality, the scene of many an exciting steeple-chase or game of polo, looked as we now negotiated its water jumps and barriers in the darkness. Here and there we came unexpectedly to the steep cuttings of water-courses or to deep pools, which our captors made no attempt to turn nor to choose the easy places; but as the fellow who held my bridle would hesitate upon the verge of such descents, my horse, pressing forward to escape the blows from the rear, would either step upon the heels of the man in front or push him unexpectedly over the edge, when all three of us would come rattling down into the water, into which we splashed, stumbling over the big boulders, each such incident terminating in a sharp blow upon my horse's nose, administered by the angry native so soon as the latter recovered his footing.

Ultimately I was, however, grateful even for these unpleasant interludes, since I was thus kept from reflecting upon the ulterior anxieties implied by our capture, owing to the effort to keep my seat in the saddle.

After circling around the town at a distance of several miles, our party struck across the fields toward the east, making in the direction of the track leading to Tetuan. Here the going was easier and we had more time to consider our situation. Varley and I, however, were intentionally kept apart from each other.

Later on we found ourselves for a few moments within speaking distance, and my companion asked how I thought this business likely to end.

"From what I have heard of Raisuli's character," I replied, "I hope we may not

be ill-treated, for should it be deemed necessary to starve or torture us into signing for a heavy ransom, I believe we shall be left to these ruffians. So long as Raisuli himself is in view, I do not think we need apprehend any violence."

"I do not see him anywhere at present, do you?" inquired Varley.

The men who led our animals now warned us to be silent. It was therefore with a distinct sense of relief and satisfaction that, just as dawn broke and when a halt had been called on a hillside, we saw Raisuli himself emerging from the gloom.

As he rode up I recognized the horse on which he was mounted as one I had lately purchased for my wife. This horse had been admirably broken to the saddle, but so soon as he was left to his own devices he became a terror to the grooms.

What, then, was my surprise to see the horse kneel in order that Raisuli might dismount, and, after the latter had thrown the bridle carelessly over the horses's neck, the animal stood, never offering to move as Raisuli advanced toward me.

Hastily dismounting, I approached the chieftain, insisting that I should be allowed to communicate with my friends, explaining to Raisuli that I was an invalid and that unless I could procure the remedies I required he might at any moment have a dead prisoner instead of a live one on his hands.

Raisuli made no answer; he merely drew forth from beneath his mantle a carnet or book, from which he extracted a sheet of European note paper, an envelope, and a pencil, which he handed me, none of these being articles used by natives.

I at once wrote to my wife, and then asked if my letter could be sent to El Minzah, our town residence, whither I presumed that my wife would have gone after what had occurred at Aidonia on the preceding evening.

Raisuli asked me whether I could guarantee that his messenger would not be arrested at Tangier.

I answered, "Certainly! My people will realize that any such detention would injure me!"

Hereupon he called one of his followers and taking the man aside gave him his instructions.

From where I stood I could see that the messenger did not at all relish these orders. However, after further insistence, the man looked up to Raisuli with an expression of devotion, and, stooping, kissed his leader's mantle in token of submission.

I then bethought me also of writing to the young Wazani chereefs to come up and negotiate my release. To this second request Raisuli did not so easily accede. However, ultimately he produced further paper and envelopes, and the messenger, taking both my missives, mounted one of my mules and rode back to Tangier.

We were now furnished with turbans and Moorish haiks or mantles, as the party did not wish to have it seem that any strangers or Europeans were with them. As the sun rose above the hills these mantles and the turbans added to our discomfort, as the heat became more and more oppressive.

About one o'clock we were halted for stream ,and the two natives who preceded me, mounted on Varley's horse, allowed the animal to drink.

In vain I endeavored to prevent the man who was leading my gray from approaching the chestnut, as both horses were great fighters; but the thick-headed mountaineer, paying no attention to my admonitions, led my horse into the stream.

In a moment the two animals were upon each other, while the natives were falling about in the water, which was full of great boulders, in the midst of which, the two horses reared and bit and fought each other, while I kept my seat as best I could under these trying circumstances.

Luckily I did not fall and ultimately

both horses and their leaders were dragged out onto the further bank by the united forces of the entire party and we proceeded on our way.

About one o'clock we were halted for luncheon in a valley between the hills, where there was neither shade nor cool water to drink, and the only food produced consisted of a few very gritty dried figs, a little hard and pungent cheese made from the milk of goats, and a glutinous and limp, yet exceedingly tough, galette or cake, which is the only form of bread used by the poorest natives. The few mouthfuls I tried to swallow sickened me, so we were only too thankful to mount as soon as we could.

In vain I tried to learn where we were going. Raisuli had remained in the rear and the surly mountaineers would not answer our queries.

THE COUNTRY TRAVERSED

The ascent, whither our course now led, became steeper as we penetrated further among the hills, and about four o'clock I met with the accident I had so long apprehended.

As we came to the bank of a rapid torrent, that was confined between steep and slippery rocks, my gray took the water jump; but not so did the sullen native who held the bridle; consequently there was a crash and, my horse rearing to recover himself, the rotten girths parted, and away went both the saddle and rider, backward down the steep declivity. It seemed to me yards before I brought up on a ledge of rock with, as I for the moment apprehended, a broken back and dislocated thigh. Here I lay quivering with pain until Varley came up, and, a little later, Raisuli. I told him of how the man's stupidity had nearly cost me a broken limb.

Raisuli reproved the man in question, and this fellow was replaced by another guide or jailer. I was hoisted with difficulty upon the saddle, now fastened on by palmetto cords, and we proceeded upon our melancholy journey. I felt I could not long endure the pain due to my fall, since my leg was already swollen from the thigh to the instep, while I was also numb with the weariness of this protracted ride, which had already lasted throughout the entire night and the better part of the day.

Every hour the country grew wilder and the road more abrupt. We only passed within sight of one miserable village, clinging to the steep hillside, and here the women and children came out to hoot and jeer at us, evidently realizing the situation and rejoicing over our sorry plight. Nor could I learn how much longer this weary march might continue to tax my failing strength; yet all this was trifling compared with what was yet to come.

A little later we reached the crest of a hill, from which we looked down upon a wooded vale, beyond which rose a rock-crowned eminence. Pointing to these bristling crags, my attendants told me that beyond these heights lay the village which was the object of our journey.

It seemed to me, wearied as I was, that it was impossible that I could endure so many more hours of fatigue and pain; but there was no help for it, since short of this undiscoverable village there was, it seemed, neither food nor shelter to be obtained.

Descending into the wooded valley, we crossed a stream, and the party halted beneath the giant oaks which stretched their wide-reaching arms above our heads. Here we halted for an hour's rest before we began the steep ascent—a path which took us up through a narrow cleft or gorge at the back of a great mass of the cliff that apparently had slid forward during some cataclysm of nature, leaving this open breach. Passing behind the fallen mass of rock, we climbed the narrow gorge, so narrow that we had great difficulty to protect our knees as our horses

struggled up the steep. And this was the gateway, the portals, giving access to Raisuli's lair.

We had yet several hours before we could reach the village of Tsarradan, situated on the southern shoulder of this mountain called Nazul. As the evening light faded, the track, which led often along the outermost edge of these lofty heights, overhung such precipitous descents that a single false step of my horse, which was now trembling with fear, might have cost me my life.

It was not until near midnight that we reached the hamlet, and I was deposited in a miserable hut composed of two rooms. The thatch had in part been blown away, and when, a little later, it came on to rain we were in a deplorable plight, since the floor of beaten clay soon became a soft ooze.

Thus we passed the night, without beds or any convenience. Of sleep I knew nothing, since, between the pain from my fall and the annoyance caused by innumerable creeping pests, I did not close my eyes. Indeed, this expedition cost me sixty hours without sleep and almost without food.

Raisuli, becoming alarmed at the report of his men as to our condition, appeared at the door of our hut on the second day after our arrival and asked whether he might enter. I was only too glad to see him and, holding out my hand, I bade him welcome. He seemed greatly relieved at my tone and manner, expressed his regret at finding me in such a condition, and added that had he known that I was in such feeble health he would have endeavored to capture some one else!

RAISULI'S PROPOSALS

This was but indifferent consolation, after all I had suffered. Still, when Raisuli went on to say that we were to consider ourselves not as prisoners, but rather as hostages, I confess that I felt relieved.

"Your horses and the arms I have taken from your dependents," he continued, "will all be returned to you. I ask nothing from you!"

I did not, however, feel so pleased when he explained that prior to our release he would exact from those who had inflicted so many wrongs upon himself and his people the following conditions:

First. The withdrawal of the body of troops now operating against him at the foot of the hills.

Second. The removal of the pasha, or military governor, of Tangier from his post.

Third. The release of all the men of the three Kabyles, or hill tribes, under the leadership of Raisuli who were at the moment confined in the prisons of Tangier or elsewhere.

Fourth. The payment of an indemnity of seventy thousand dollars, to be recovered against the Oolad Abd-el-Saduk.

Fifth. That Raisuli should be made over-lord of the villages of Zeenats and of Breeje!

As Raisuli concluded, I felt like saying, "Why not ask to be proclaimed, out and out, Sultan of Morocco?" In fact it seemed to me that it was quite as likely that the Sultan, Abd El Aziz, would agree to renounce the throne in favor of Raisuli as to accede to such conditions as the latter proposed to demand before consenting to our release. I literally felt my heart sink as I was thus informed of the nature of these conditions. I did not then know, however, of the orders which, even at that very moment, had been issued here in Washington; thanks to which energetic action on the part of our government my release was subsequently secured.

But, to return to my talk with Raisuli. "The indemnity you ask from the Abd-el-Saduk family," I said, "will ruin them."

"Precisely," he replied. "They have inflicted worse than death upon me. It is precisely in order to be revenged upon them that I have carried you off."

THE HISTORY OF RAISULI

He then proceeded to recall the circumstances of his own capture by the then Pasha of Tangier, Abd-er-Rahman Abd-el-Saduk, an incident that all at Tangier knew of at the time, some nine years prior to my present misadventure.

Raisuli, then as now, had been up in arms against the government, owing to an attempt on the part of the Pasha of Tangier to force upon the tribes of Beni Emsauer, Ben Idder, and Beni Arose a creature favored by the Abd-el-Saduks, as kaid of their district, an appointment in contravention of the arrangement sanctioned by time and custom, whereby these Berber tribes were entitled to the nomination of candidates to these posts, from which candidates the Sultan's government selected the governors, or kaids, of the district.

Abd-er-Rahman having failed in his attempt to establish his creature as kaid over these three tribes, united under the leadership of Raisuli, sent to the latter proposing an amicable settlement of the points at issue.

The latter, trusting to Abd-er-Rahman's safe conduct, accepted the pasha's invitation, and while seated at the latter's table was seized, in violation of the governor's solemn assurance, bound, and sent to Mogador, where Raisuli was chained in a sitting posture to the wall and where he thus remained four long years, during which he was never able to stand during the day nor to lie down at night.

The object of this cruel punishment was to cause Raisuli's death, the cowardly pasha not daring to openly do away with his prisoner, whose release from this horrible suffering was due to a member of one of the foreign legations at Tangier. While on a special mission to the capital this official had informed the Sultan of the circumstances of the case.

Abd El Aziz immediately issued an order to release Raisuli from his chains, excepting the fetters or anklets which confined his feet. Subsequently, after five years' confinement, Raisuli was unconditionally restored to liberty.

His property, mostly in flocks and herds, had, however, been appropriated by his agents or partners.

Failing to obtain justice, Raisuli had called together some of his more faithful adherents and had raided the zereebas or farms of his faithless associates, two of whom had subsequently been killed in an attempt to surprise Raisuli, himself.

This incident had again placed Raisuli under the ban. Forces were sent down from the capital with orders to bring in Raisuli, dead or alive.

It was these circumstances that had led the latter to effect my own abduction in order to bring the pressure of a threatened intervention by one of the powers to bear upon the Sultan and thus enable Raisuli to demand a free pardon for himself as a condition of my own release and also the payment of a heavy indemnity in order to be thus revenged upon the treacherous pasha, the cause of all his troubles.

That the Moorish authorities were fully alive to the necessity for immediate action was shown by the arrival the very next morning of an emissary from Hadj Mohammed Torres, the Sultan's delegate minister of foreign affairs at Tangier.

Torres had entrusted these negotiations to a cousin of Raisuli himself, a certain Sid Hassan. In accordance with Raisuli's suggestion, I gave this agent a note to Minister Gummere, the American representative at Tangier, together with other letters to my family.

This opportunity, which Raisuli allowed me without any restriction, proved an inestimable blessing, and the knowledge that I could thus communicate at pleasure with family and friends relieved the situation of its worst feature. I had always had a peculiar horror of being carried off and held to ransom, a misfortune which is almost more maddening to

the family and friends of the victim of such outrages than to himself. Therefore I felt grateful to Providence that since such a misfortune had overtaken me, I had at least fallen into the power of the most kindly and gentle of brigands imaginable. Indeed, I had never conceived of such a situation as that in which I found myself.

HIS PERSONALITY

In so many respects the man interested and attracted me in spite of all my natural motives for dislike. Raisuli was at once so gracious and dignified, not to us only, but to his own wild adherents, who evidently idolized their chieftain, whose position among them seemed that of the head of a Highland clan in the olden times.

He could not bear to hear a child cry, while on several occasions I noticed his care even to avoid allowing the bees collected on his cup to drown, as I saw him lift them out with his spoon or finally empty the cup itself onto the grass. Then, too, he was so quick to see the humorous aspect of a situation, while his repartee was as immediate and to the point as though he had been born in County Galway itself. In fact I discovered to my consternation that I was beginning to like the man in spite of my natural resentment. I found myself unconsciously accepting his contention that he was not a mere brigand or cattle-lifter, but a patriot struggling to rescue his Berber followers from the tyranny of the corrupt chereefian officials. His charm of voice, the natural poise and dignity of his manner, his self-control under provocation, all betrayed a superior character. He is in fact a born leader and with a certain statesmanlike quality. He deplored the condition of his country, the feuds which separate the tribes, the many deeds of violence, and the blood so uselessly shed.

In fact, this strange experience while in camp with Raisuli at Tsarradan began to assume an aspect of unexpected and idyllic charm. The life of the natives; the little touches of more gentle human character; the tiny child who offered me fruit, which I at first declined, until I noticed the expression of disappointment and mortification upon the boy's face, and then the radiant and almost ridiculous satisfaction of the little fellow when I pretended to enjoy his half-ripe offering; the many attempts of the wild people about me to propitiate me; their curiosity as to our own manners and customs, as when one venerable inhabitant of the village led me gently aside to inquire why we walked so energetically up and down the village green. "For health's sake," was my reply. "Indeed?" said the old Mohammedan, "and may I ask how many such daily turns, up and down, it may require to keep a Christian in good health!"—all afforded matter of interest and reflection. And then when the first answer from our home reached us, and we learned that already cablegrams had been received from Washington announcing that the squadrons under Rear Admirals F. E. Chadwick and Jewell, then coaling at the Canaries, had been ordered to Tangier to secure our release—and, above all, when I read the telegrams from the United States showing the wide interest so generously taken in our misadventure—when we realized all this, words cannot describe the emotion called forth by these evidences of interest and good will.

The next great excitement was the arrival, about a week later, of the relief expedition headed by the two young chereefs, Mulai Ali and Mulai Ahmed, sons of the late grand chereef of Wazan and of his English wife. Their approach was heralded by discharges of musketry, fired, as Raisuli informed me, by the inhabitants of the various villages on the route, a different route to the one by which we had been conducted. These discharges were to give Raisuli notice that strangers were entering the district, for "not only are you the only foreign-

ers," said the chieftain, "who have set foot among these Beni Arose people, but we do not even allow natives from other localities access, unless in some especial case like the arrival of these friends of yours, and," he added with a grim smile, "who are also distant relatives of my own!"

When at last the long line of men, mounted and on foot, with its train of baggage animals, appeared we were not a little gladdened by the sight.

Mulai Ali, the elder brother, pitched his camp near at hand, and after a long conference with Raisuli, the younger of the Wazani chereefs returned to Tangier to communicate to our own officials the state of affairs.

Not only had our friends sent us a handsome tent, with furniture and supplies of every description, but also a cook and servants to wait upon us, so that we suffered henceforth no undue hardships of any sort, while the presence of Mulai Ali, who speaks both English and French, was a most welcome addition, although our intercourse with "The Boss," as Varley and Mulai Ali dubbed Raisuli, diminished materially.

Another event also tended to augment my anxiety, which was the arrival of two very evil-looking emissaries from Bou Hamara, the pretender to the throne, and who wrote urgently, insisting that Raisuli should entrust us to his, Bou Hamara's, care. I had so suffered from my tiresome ride to Tsarradan that I felt I would far rather be shot where I was than be dragged off to die upon the road to Taza, situated in the very heart of these cruel mountains.

Raisuli explained that the Pretender wished to secure our persons to use as a shield in case he himself should be too hard pushed by the Sultan's troops.

HELP FROM MY COUNTRY

While standing near Raisuli one day on the village green, of which we were now allowed the freedom, one of his followers came up from Tangier, almost breathless from his haste, to report the arrival of the two American squadrons. The man described how the eight frigates had entered the bay, one after another. He told of the anxious deliberations of the Moorish authorities and of the alarm of the native inhabitants, who feared the town might be bombarded. The man declared that the place was *mkloub,* or upside down.

I watched Raisuli with anxiety, lest apprehending the landing of marines, with a view to our relief and his own capture, he might endeavor to drag us to some more distant and inaccessible retreat. What was then my surprise when looking up with a bright smile, he said, "Well, I think I can now congratulate you!"

"I do not understand you," I replied.

"I mean," answered Raisuli, "that the presence of these vessels will lead the authorities at Tangier to make such representations to the Sultan as may result in his acceding to my demands, and then you will be able to return to your friends."

This calculation of the insurgent leader was soon proved to have been justified, since a runner carrying a dispatch, one of four copies of the same document, each carried by a separate courier, was held up by some of Raisuli's partisans, and thus we learned the, to us, grateful information, which was confirmed by the arrival of Sid Hassan a few days later to say that His Chereefian Majesty had been most graciously pleased to accede to the demands which Hadj Mohammed had forwarded to Fez.

THE DISPOSAL OF THE RANSOM MONEY

Raisuli was now confronted by the problem as to what disposition he was to make of the seventy thousand silver Spanish dollars which he demanded for our release. Here at Tsarradan there were no iron safes, nor so much as a house with a cellar, while the thatch of

skaff, or dried reeds, the only roofing of the houses, offered but poor security should he leave so much coin stored in a village where he himself was but a transient sojourner.

To the great amusement of Mulai Ali, and to my own considerable astonishment, the solution of this troublesome question which Raisuli proposed was that "La Senora," as the natives called my wife, should receive the seventy thousand dollars from Torres and deposit the money to her own credit in Tangier at the bank where we were accustomed to cash our checks, and that he, Raisuli, might then draw upon Mrs. Perdicaris as occasion should require.

I, however, entirely declined to request my wife to accede to this singular proposal, and when I explained to Raisuli the suspicions to which such an arrangement might expose us, he at once said that he would be the last to wish to place us in such a position.

It was finally arranged that the younger of our Wazani friends should bring to a certain village half way between Tangier and Tsarradan twenty thousand dollars in silver and the remaining fifty thousand in certified checks on the Comptoir d'Escompte, the French bank at Tangier, together with the prisoners whose release Raisuli had demanded, and that our captor should accompany us to this village, of which the Sheik, El Zellal, was one of his adherents. These negotiations occupied some time and led to many journeys of Sid Hassan back and forth from Tangier to Tsarradan.

After six weeks, and on the evening preceding our departure, we strolled from the village green with Mulai Ali; nor were we now, as had always hitherto been the case, accompanied by any of Raisuli's men. During our walk we fell into conversation with a native from another village, and who made some allusion to two unfortunate Spanish children, for the boy at least was but a child, though his sister was fifteen. This brother and sister, the children of a poor charcoal-burner, had been stolen about two years prior to our own adventure, nor had they been recovered, despite the pressure exerted by the Spanish authorities at Tangier.

We now learned to our horror that these unfortunate children had been carried off by the very man in whose hut we had spent so many sad hours, and that they had not only occupied the very room where I slept, but that after a long detention they had been ultimately killed in the garden and were buried not far from where our horses were tethered. This discovery showed the lawless character of these Berber followers of Raisuli, and also that we ourselves had been in more danger than we realized, had any mishap to Raisuli occurred while we were among these savages, for such these Berbers really are, possessing neither a written language nor any of those elements of culture or refinement which almost every other white race boasts.

I confess that during this our last night in that wretched hut, the scene of the sufferings and humiliations of those unfortunate Spanish captives, I scarcely closed my eyes.

OUR RETURN

The next morning it was still dark when our men began loading the pack-mules, and we reached the crest of the mountain, which lay between us and Tangier, just as the sun rose. Never have I anywhere witnessed a scene of more wild and fantastic charm. A slight mist hung about the base of the rocks, whose peaks and turrets were now flecked with crimson or lilac, now shaded with purple, by some passing cloud.

On our left rode Mulai Ali, arrayed in a silk bournous of spotless white, followed by all his men, while on my right Raisuli bestrode his gray charger. The dark, thick cords of twisted camel's hair crossed about his white turban, and the

cartridge belt over his broad chest made him look every inch a man of daring deeds.

Upon this occasion Varley and I rode our own horses, or, rather, I rode the black horse which Raisuli had ridden on our way from Tangier, and as we climbed again, but in how different a mood, those rocky steeps I told the latter of my surprise at the horse's behavior. A smile played upon the chieftain's lips as he answered, "Oh! that is easily explained! Did you not know that before you purchased that horse it belonged to me?"

"I did not, nor," I added, "do I seem to have known as much of your affairs as you evidently knew of mine! Still," I continued, "this does not entirely explain the very different behavior of the horse. I can understand that you could, by the use of spur and bridle, compel the horse to kneel in order that you might dismount, but I am still at a loss to account for his standing obedient and motionless when you had left him to his own devices!"

"This is also easily explained," said Raisuli. "The fact is," he continued, "you Roumi are of too easy a disposition. You spoil your wives, your children, your servants, and even your very horses. These animals," he said, "are quite intelligent enough to know that they must obey *our* wishes, even when we are not in the saddle!"

"If these are your views of how we should deal with men, women, and even with animals, I will mention the fact to the Sultan when I next see him," I replied jocosely.

"Yes," continued Raisuli, in the same strain, "and if His Chereefian Majesty indulged in fewer European fads, and had a little more grip, and would use the spur more freely, *he* would have a better seat in *his* saddle," referring to the expression that the throne of the Sultan should be his saddle.

We continued during the entire morning in a northerly direction. Our path after taking us over the lofty crest of Mount Nazul and through the forest of almost primeval oaks beyond, again led us along the crest of a line of hills—a path at times so narrow that we were compelled to proceed in single file. At such moments our escort trailed out over half a mile or more, passing between steep slopes or even abrupt precipices on either side of us. From these heights we could see the distant sea and the Spanish coast beyond, and at last Raisuli pointed out to me a white fleck upon the distant sands of the nearer African coast which he said was Tangier.

About noon we found ourselves looking down upon a village many hundred feet immediately beneath us. Here a halt was called. This was the eyrie of El Zellal, a semi-fortified place, hanging on to the steep hillside, half village, half Zereeba.

Raisuli sent forward some of his followers on foot to be sure that no government troops were hiding within the village, the approach to which was through a tall gateway of masonry, and when his men reappeared, signaling that no foes were concealed within, the chieftan turning to me said, "Do as you see me do!" As he spoke he spurred his steed violently; whereupon the animal, squatting upon his haunches after the manner of a dog rather than that of a horse, slid down the steep descent.

Congratulating myself that my own horse, having been trained by Raisuli, probably possessed the same accomplishment, I followed suit, as did the other mounted members of the party, and presently we all found ourselves gaily tobogganing down the steep hillside and through the gate right into the village, where we had some difficulty in pulling up at the entrance of the residence of El Zellal himself, so abrupt was the incline or downward grade.

Here we were detained, owing to the absence of Mulai Ahmed, the younger Wazani chereef, who did not arrive at the appointed hour with the ransom and Raisuli's men who had been released

from prison—a delay due in part to the difficulty of bringing with him, in addition to other impedimenta, a huge mule litter to carry me, should I not be able to endure so many hours in the saddle.

In the meantime we waited amid a solemn silence, except when some much-required food was served, and as we sat there it might have seemed more as though we were in some house of mourning rather than in one so shortly to become the scene of our eagerly desired liberation.

THE ARRIVAL OF THE RANSOM

At last the mules bearing the silver dollars, carefully packed in boxes, arrived; but now luncheon was again served in honor of Mulai Ahmed, and must be partaken of, after which the bullion was counted in another room.

Here I was presently summoned, and invited to seat myself between Raisuli and Mulai Ahmed, while a group of the more important natives, including El Zellal, as well as men from other localities, were ranged around the room.

"The silver," said Raisuli, addressing me, "has been counted—twenty thousand dollars, as stipulated, in Spanish dollars; but these letters," showing me as he spoke a check book containing certified checks on the Comptoir d'Escompte, the French bank at Tangier, "of the value of these, which are supposed to represent fifty thousand dollars, I know nothing. However, I will accept them on your personal guarantee, but on that condition only."

When I had examined the checks certified by Torres and by El Gannam, the Sultan's delegate minister of finance, I gave the required assurance verbally, and Raisuli, leading me to the door, where I found my horse waiting for me, bade me adieu, saying that he had learned to look upon me as a friend, and that he hoped I cherished no ill feeling on account of my detention. He furthermore assured me that should any danger menace me in the future, that not only he himself, but any of the men of the three tribes under his orders, would hasten to my relief.

Thus I left him, and pushing on as rapidly as we could we were soon in the midst of the large armed escort which had come from Tangier to see us safely home. It seems there had been some rumor of an intention on the part of other tribes to secure our persons after we should have left Raisuli and to hold us for further ransom.

Fortunately our further journey suffered no delay other than that caused by the transport of the litter, of which I was most thankful to avail myself, since I had twice suffered while at Tsarradan from severe nervous prostration.

This reminds me to mention with a grateful heart that my wife having applied to Admiral Chadwick, when she learned of my second attack, to inquire whether a surgeon could be detached from one of the vessels under his command, every medical officer in the fleet at once volunteered to go and attend me, even though warned that they might be themselves detained by Raisuli.

We did not reach Tangier until long after dark. As we were pushing forward in the gloom of evening a company of native cavalry, which had been sent out to report our arrival, galloped up, and so soon as they discovered we were of the party, turned and hastened back to announce our coming, as to which there was even yet grave anxiety. An hour later and we could see the town lights, and also those on the mastheads of the vessels in the bay, and we could even make out that these were answering signals from the United States consulate in the town. Yes, our friends now at last knew that we were near at hand.

I struggled out of my litter and onto my horse and presently galloped through the gateway of my home, amid the acclamations of friends and neighbors. As I descended from my horse Admiral Chadwick himself, who had with Minister Gummere awaited my arrival even until this late hour, for it was now nearly

midnight, grasped me by the arm, and thus was I literally restored to my family by the gallant officer in command of the fleet which the United States government had so generously sent to my rescue. But for this strenuous and successful intervention I might still be detained among those mountains. Upon this point I insist the more, since it has been suggested that we owed our rescue to other agencies.

To the joint exertions of my friends, Minister Gummere, and to the British Minister, Sir Arthur Nicolson, I am deeply indebted—indeed, I can find no words adequate to describe what I owe to them, as well as to Admiral Chadwick, not merely for their untiring efforts on behalf of Varley and myself, but for the sympathy and solicitude of which my wife was the recipient throughout these long six weeks, so much more trying to her even than to ourselves, since she indeed was the greater sufferer.

With this expression of my gratitude to the government and to the people of the United States, I conclude this account and beg to thank you also for the indulgent patience with which you have listened to so long a narrative.

NOTES ON MOROCCO

MOROCCO in the early days of the Christian era was one of the granaries of the Roman Empire. Her lands today are no less rich; but, owing to the lawlessness of a weak government and a strict prohibition of the exportation of grain and cattle, they are now for the most part abandoned and have been untilled for many centuries. Morocco contains about 250,000 square miles, one-half of which, or an area almost equal to that of North and South Dakota combined, is covered to a depth of six to nine feet with a black loam which rivals in fertility the soil of our prairie states. Her location makes her too valuable to leave undeveloped. Morocco at present exports annually only $5,000,000 worth of beans, skins, hides, fruits, olive oil, and wood. Her imports amount to about $6,000,000 worth of cotton goods, sugar, tea, and hardware. The country is rich in the deposits of copper, iron ore, antimony, and rock-salt, and gold and silver are reported.

The country is generally mountainous, the Atlas range, which attains an elevation of nearly 15,000 feet, traversing it in several parallel chains from southwest to northwest and sending out numerous cross spurs. The climate in many sections is delightful and very healthful.

In no country in the world probably does woman have such a low status as in Morocco. The usual practice of the Mohammedan of Morocco is to divorce his wife after he has lived with her six or seven years, even though she may have borne him children. He then takes a younger and more comely partner, while his former wife must be satisfied with any husband she can get. After several years with her second husband, she is once more discarded, and marries again; and so the process goes on, each marriage being lower in scale, until she dies in poverty and wretchedness of the meanest description.

GOOD BOOKS ON MOROCCO

"The Land of the Moors": A comprehensive geographical description. Budgett Meakin. Macmillan Co. Illustrated. $5.00.

"The Moorish Empire": A historical epitome. Budgett Meakin. Macmillan Co. Illustrated. $5.00.

"The Moors." Budgett Meakin. Macmillan Co. Illustrated. $5.00.

"Morocco As It Is." Stephen Bonsal. Harpers. $2.00.

"A Ride in Morocco": Travel on the "beaten highway," with interesting incidental experiences of the author. Frances MacNab. Longmans, Green & Co. $5.00.

"Things Seen in Morocco": Being a bundle of jottings, notes, impressions, and tales. A. T. Dawson. Funk and Wagnalls. $2.50.

"In the Tail of the Peacock." Isabel Savory. James Post. New York. $3.50.

"Into Morocco." Burton Holmes. With many illustrations from photographs by the author. The volume is one of the series of Burton Holmes' Lectures and is not sold separately. McClure, Phillips & Co.

OUR HETEROGENEOUS SYSTEM OF WEIGHTS AND MEASURES

AN EXPLANATION OF THE REASONS WHY THE UNITED STATES SHOULD ABANDON ITS OBSOLETE SYSTEM OF INCHES, TONS, AND GALLONS

By Alexander Graham Bell

The following pages contain an informal address to the Committee on Coinage, Weights, and Measures of the U. S. House of Representatives on February 16. The bill under consideration reads as follows:

Be it enacted by the Senate and Hou e of Representatives of the United States of America in Congress assembled, That from and after the first of July, nineteen hundred and eight, all of the Departments of the Government of the United States, in the transaction of business requiring the use of weight and measurement, shall employ and use the weights and measures of the metric system.

The bill was introduced in the House of Representatives by L. N. Littauer, Representative from New York, and is known as "the Littauer Bill.". Dr Bell's address is published here through the courtesy of the chairman of the committee, James H. Southard, of Ohio.

THIS is one of the briefest bills I have even seen — only five lines—but it is pregnant with consequences to the people of the United States. It means very much more than appears upon its face. This is a mandatory bill requiring the use of the metric system in the departments of the government, but of course Congress would not pass a bill of this kind unless as a step toward the introduction of the metric system generally in the United States. So that this really means, if you pass it, that you have decided to abolish the chaotic systems of weights and measures we now have and substitute the metric system not simply for the government departments, but for the whole of the United States. This bill is simply a logical step in the consummation of the greater plan, and I hope it will pass.

It is obvious that our present system of weights and measures is in a very chaotic condition. It certainly is not right that a coal company should be able to pay their miners by a ton of 2,240 pounds and then sell their coal by another ton of 2,000 pounds. But even the pound itself varies in weight according to circumstances. Some of our people employ a pound of 16 ounces, others a pound of 12 ounces; so that it is necessary in business transactions to have a definite understanding as to the kind of pound we employ—whether avoirdupois or troy weight. The ounce, too, varies. Our apothecaries use an ounce of 8 drams, whereas there are 16 drams in an ounce avoirdupois. Thus the avoirdupois pound consists of 16 ounces of 16 drams each, equivalent to 256 drams, whereas the pound used by our apothecaries contains only 12 ounces of 8 drams each, equivalent to 96 drams.

In a similar manner we have different kinds of bushels and gallons and other measures in common use by different sections of our people; and if there is anything that is clear it seems to be this—

that we need uniformity in our system of weights and measures.

Of course, it matters little what system may be employed by an individual, so far as he himself is concerned; but the moment he has dealings with other individuals the necessity for uniformity and a common understanding arises. The right of the individual to choose his own methods of measurement must give way to the convenience of the community of which he forms a part; in a similar manner the right of sections of the community like apothecaries, silversmiths, etc., to have their own peculiar system of measurement should give way to the right of the community as a whole to have uniformity and a system convenient to all.

Every state in the Union might with perfect propriety have a different system of weights and measures if there were no interstate transactions or mingling of people from different parts of the country, but the interests of the nation as a whole demand uniformity throughout the length and breadth of the land.

In achieving such a result the United States might very well establish a peculiar system of its own, without reference to the usages of other countries, if we formed an isolated people, having no dealings with the rest of the world; but in making a change—and the necessity for a change is very obvious—it would be advisable to adopt a system that would not only be convenient for our own people, but would also be convenient for the other peoples of the world with whom we carry on trade and commerce.

No one doubts that the metrical system is superior to the crude methods of measurement we employ. It is therefore useless to expect that foreign countries employing the metrical system will ever change to our methods of measurement; from which it follows that if international uniformity is to be secured it is we who must give way. We must either adopt the metrical system or some other system—not our own—which may have some chance of international adoption.

At the present time, however, the metrical system is the only system known that has the ghost of a chance of being adopted universally by the world. As a matter of fact, it is now international in character, for practically all of the civilized nations of the world have already adopted it with the exception of the English-speaking peoples, who employ an admittedly inferior system.

The metrical system was legalized in the United States in 1866 and is already in use by a portion of our people, thus adding to the existing confusion. Our scientific men especially employ it, almost universally, and merchants having dealings with foreign countries are obliged to use it to a greater or less extent. Our imports from non-English-speaking countries are largely expressed in metrical measures, and in exporting to these countries our merchants must adopt the metrical system or be placed at a disadvantage with competitors who already employ it; for people accustomed to the metrical system will not take the trouble of translating our measures into their own system in order to understand what they are buying, if they can obtain the same goods elsewhere expressed in the measures with which they are already familiar. There can be no question that in competing with metrical countries for the trade of the countries already employing the system, our commerce is seriously handicapped by the inconvenient and antiquated systems of weights and measures in use in the United States. This means that we are at a disadvantage everywhere in the world excepting in dealing with Great Britain and her colonies.

A WASTE OF LABOR

Few people have any adequate conception of the amount of unnecessary labor involved in the use of our present weights and measures. Scientific men and merchants may have the necessary skill with figures to enable them to use the metrical system, but how about the common people of the country? It is just here that

the metrical system possesses special advantages—reducing to a minimum the amount of labor and skill required in the solution of the every-day problems of life involving the use of figures.

The people of Great Britain, having no practical experience by actual use of the advantages of a decimal system of measurement, may have difficulty in realizing the amount of unnecessary drudgery through which they are obliged to go in order to obtain a solution of the simplest arithmetical problems, and they therefore have some excuse for remaining in the rear of progress; but the United States has no such excuse to offer for her hesitation in joining the majority of the civilized nations of the world in the adoption of the metrical system. We already have a decimal system of money, and our people are therefore prepared to appreciate the great saving of labor involved in pushing the decimal principle into all our methods of measurement. We would not, if we could, go back to the old pounds, shillings, and pence of our ancestors, for we can realize through our every-day experience with dollars and cents the drudgery we are saved in all financial calculations, and are therefore prepared to appreciate, by analogy, that corresponding benefits would arise from our adoption of a decimal system in our weights and measures.

Let us compare for a moment the arithmetical processes involved in calculating by the old method of pounds, shillings, and pence with the simpler process employed when we deal with dollars and cents and then apply the results to the metric system of weights and measures. Take any problem that may occur to your mind. Let us take, for example, the figures 1906, which express the present year. Now if we had 1906 pennies and wanted to find out how many pounds, shillings, and pence this amounted to, we must divide 1906 by 12 to find the number of shillings, and then divide the product by 20 to ascertain the number of pounds; but the moment you adopt a decimal system of money like our own this kind of drudgery becomes entirely unnecessary. No calculation whatever is required in order to reduce the figures from one denomination to another—we simply shift the decimal point. We know at once, without calculation, that 1906 cents amount to 19.06 dollars.

In a similar manner, in using the metric system we know without calculation that 1906 centimeters amount to 19.06 meters, and that 1906 grams amount to 1.906 kilograms. No calculation is involved.

Now compare this simple process with the laborious processes involved in the use of the ordinary measures of length and weight. Take 1906 inches—how many feet and yards? We must divide 1906 by 12 to find out the number of feet, and then divide the product by 3 to ascertain the number of yards. Or take 1906 ounces—how many pounds?

*Mr Chairman:** What kind of ounces?

WE HAVE THREE KINDS OF POUND

Mr Bell: Yes—what kind of ounce, for we have more than one. And what kind of pound—avoirdupois weight, troy weight, or apothecary's weight? In one case we may have to divide 1906 by 16, in another by 12; but the point I wish to make is this: that a calculation of some sort is involved in the mere process of translation from one denomination to another in the same kind of measure, while by the metrical system all this kind of labor is saved—we merely shift the decimal point.

The amount of labor saved in calculating square measure and cubical measure is still more remarkable. Try square measure first. Take the figures 1, 2, 3, 4, 5, 6: 123,456 square inches, how many square feet? I will not try to work it out, but you must divide this number by 144 to get the number of square feet.

* James H. Southard, Representative from Ohio.

You will probably require paper and pencil to perform the computation; but on the metrical plan the solution is so easy that any intelligent person can arrive at the result mentally without any calculation whatever. 123,456 square centimeters is equivalent to 12.3456 square meters.

Even should we forget that there are 10,000 square centimeters in a square meter, a moment's thought will enable us to recover the knowledge. The merest tyro knows that a meter consists of 100 centimeters (the name "centimeter" itself meaning "one-hundredth of a meter"), so that a square meter is a surface measuring 100 centimeters one way by 100 centimeters the other. 100 times 100 is 10,000, the figure 1 followed by four ciphers, which means that we must shift the decimal point four places to the left to ascertain the number of square meters.

HOW MUCH WATER IN THE RESERVOIR

Now try cubical measure; take any problem that comes to the mind. Suppose we have a rectangular tank or reservoir of a certain length, width, and depth—how much water will it hold, and how much will the water weigh?

We begin of course by multiplying together the length, width, and depth to ascertain the cubical contents. This kind of calculation must be performed, whatever the system of measurement employed, and I shall simply say that the computation is much simpler on the metrical plan than on the other because no non-decimal fractions are involved. If the length, breadth, and depth be expressed by an exact number of feet, the labor involved in this portion of the calculation will be the same in both cases; but as a general rule in such computations one or more of the dimensions will not be exact in feet, but may be four feet "and a half," or 3 feet "4 inches," etc., and we then find it advisable to reduce the whole to the lowest denomination used—say cubic inches. In such a case the metrical system has greatly the advantage. But after the whole computation is over and we have ascertained the cubical contents in the lowest denominations employed, the problem is solved if the metrical system is used, whereas much labor is required on the present system to put the answer into final shape.

A LABOR-SAVING DEVICE

We shall take a specific case, and in order to show the ease with which the problem can be mentally solved on the metric system with the very largest figures, we will take a sum involving nine figures, thus running up into the millions. Having measured our tank or reservoir and performed our initial calculation, suppose we find that the tank contains 123,456,789 cubic inches of water.

How many gallons have we there? And how much does the water weigh?

I will not attempt to work the result out to its final conclusion even with the aid of paper and pencil, for I must confess that my memory does not hold the exact number of cubic inches contained in a gallon and I have no means of recovering this knowledge excepting by reference to a printed table. Then again my memory does not retain a distinct impression of the relation of weight to volume of water on our present system. The problem is therefore absolutely insoluble to me at the present moment. I must consult some reference book for the information that would enable me to work it out. But put the problem in metrical terms and the problem is solved as soon as you have ascertained the cubical contents in any of the metrical denominations you prefer; the translation of the result into other more convenient denominations of the metrical system requires no calculation and is a mere question of putting the decimal point in the proper place.

For example, suppose we find that our tank hold 123,456,789 cubic centimeters of water. How many liters have we

there, and how much does the water weigh? The answer is 123,456.789 liters, weighing 123,456.789 kilograms.

Now, supposing we forget for the moment that one liter of water contains one thousand cubic centimeters and weighs one kilogram, it is not necessary for us to consult a work of reference. A moment's consideration of the elementary propositions of the metric system will enable us to recover the knowledge for ourselves by mere mental computation. We cannot forget that one cubic centimeter of water weighs one gram, for that fact lies at the root of the relation of weight to volume in the metrical system. We cannot forget the equally elementary proposition that a cube having a side of 10 centimeters has a volume of one liter, for this lies at the root of the relation of length to volume on the metrical system. If we do not know these facts, we do not know the metrical system at all.

A cube having a side of 10 centimeters has a volume of one liter; then how many cubic centimeters are there in a liter? Picture to yourself a cube of the required dimensions and mentally calculate the cubical contents. It is 10 centimeters long, 10 centimeters wide, and 10 centimeters deep. Multiply these dimensions together; 10 times 10 is 100, and 10 times 100 is 1,000. Here we recover the forgotten fact that a liter contains 1,000 cubic centimeters. But one cubic centimeter of water weighs one gram; from which it follows that 1,000 cubic centimeters (one liter) weigh 1,000 grams (one kilogram). 1,000 is the figure 1 followed by 3 ciphers; and this fact directs us to shift the decimal point 3 places to the left in order to convert cubic centimeters of water into liters of volume or kilograms of weight.

Contrast the amount of labor involved in this simple process with that involved in ascertaining from the number of cubic inches of water the volume of water in gallons and its weight in pounds. Nothing, I think, can better illustrate the fact that the metric system is a labor-saving device of the greatest importance and value.

It is safe to say that after the metric system has been adopted by the United States and our people have become accustomed to its use we would no more dream of going back to the present system of weights and measures than we would think of carrying on the processes of arithmetic through the medium of the old Roman letters in place of the Arabic numerals we now employ.

THE EXPERIENCE OF DR BELL'S LABORATORY

The laborious nature of the calculations involved in the use of our ordinary measures was forced upon my attention a number of years ago by the fact that I commenced to carry on in my laboratory a series of experiments with man-lifting kites—enormous structures, which had to be made very light in proportion to their supporting surfaces in order to carry a man up into the air. These kites cost several hundred dollars apiece to construct; and it was therefore found advisable, after repeated failures, to calculate beforehand what the weight of a proposed structure would be; and then calculate, from the total amount of silk employed and from the angle which the oblique surfaces made with the horizon, the amount of effective surface upon which the wind would act (the projection of the oblique surfaces on a horizontal plane). From these figures the ratio of weight to support surface for the whole structure was ascertained and the fact determined whether the proposed kite would fly in a moderate wind—before actually commencing its construction. The calculations proved to be so laborious that I found it simpler to translate the proposed measurements into metrical terms and then work out the solution on the metrical plan.

The translation of the ordinary measurements into metrical terms, and *vice*

versa, involved considerable labor on my part, and it seemed advisable therefore to introduce the metric system into the laboratory and have all measurements made directly in metrical terms. The only question in my mind was whether ordinary workmen, carpenters and mechanics accustomed to the usual methods of measurements, could or would employ the metric system.

The result may be of interest to the committee as bearing upon the question of the ability of the common people of America to handle a new system of this kind. No difficulty whatever was experienced in the use of the system, and the total expense involved in the change amounted to a few dollars for the purchase of a set of metrical weights and measures. The same balances formerly employed were equally efficient in weighing by the metrical system, and even the old weights were utilized as supplementary weights, with their value in grams distinctly marked upon them. No change was required in the machinery and tools employed, simply a change in the method of measuring the output.

For convenience of reference a chart of the metrical system was hung up in the workshop, but no effort was made to have the men master the new names involved, excepting so far as they were introduced by actual use. The names of which the men were most afraid, like dekagram, hectogram, dekameter, and hectometer, were really not required at all in actual use. The only terms employed at first were meter, centimeter, and gram; but the necessities of the laboratory soon introduced millimeter, kilogram, and liter. In this connection it is rather interesting to note that the word "decimeter," although understood, remained among the unused terms, the men preferring the expression "10 centimeters," just as we usually prefer to call a dime "10 cents" rather than a dime. So, too, a cubic decimeter (or liter) was preferably called "a cube of 10 centimeters."

So long as I did not ask my men to translate from one system into the other, all was plain sailing. They would have difficulty in translating from pounds and ounces into grams or kilograms, or from feet and inches into centimeters or meters; but in the actual measurement of length with a metric measure in hand, and in actual weighing with metrical weights, no difficulty whatever has been experienced.

The use of the metric system in my laboratory has greatly facilitated all calculations and the men like it.

WE ARE ONE OF THE LAST NATIONS TO ADOPT THE METRIC SYSTEM

The Chairman: It has been contended by one or two people at least who have set out to oppose the introduction of this system that in France and in Germany, where it has been used as long as anywhere, it is not really the system of weights and measures of those countries. You have been there?

Mr Bell: I have been in France; and so far as my observation has gone it seems to be in universal use there. I understand that it is also employed in Germany. In fact we are one of the last nations to take it up. I understand that nearly all the civilized nations of the world have already adopted the metric system, with the exception of Great Britain, the United States, and the British colonies.

The Chairman: Of course we realize that an argument can be made about the confusion which exists in weights and measures in this country in a great many different lines. For instance, in the United States Mint they have four standards of weights—apothecary's, avoirdupois, troy, and the metric measures.

Mr Bell: I do not think any system of weights and measures has any chance of becoming universal except the metric system, and its growth during the short time it has been in existence seems to indicate that it has such a chance.

THE REASON WE DID NOT ADOPT THE METRIC SYSTEM WHEN WE ADOPTED DOLLARS AND CENTS

It has always been a matter of wonder to me why the United States, when it changed from the old system of pounds, shillings, and pence to the present dollars and cents, did not at the same time go the whole way and adopt the metric system of weights and measures. The answer, however, is simple. The metric system had not then been invented, or rather had not anywhere come into use. Propositions foreshadowing its advent were under consideration, but the metric system as we know it did not appear until after the passage of our coinage act of 1792. It was only adopted by France about the beginning of the nineteenth century, and if I remember rightly—and if not Mr. Stratton will correct me—the first standard kilogram and the first standard meter were not deposited until 1830.

*Mr Stratton:** It was just about the time that we made the change in coinage that they were considering this system. Congress directed John Quincy Adams, the Secretary of State, to make an investigation in regard to the matter, and he did so, and he made a report in which he called attention to the fact that the metric system was then being developed; and he advised us to watch it closely, and he said that it was in his opinion a thing we ought to adopt if it proved successful.

Mr Bell: In 1790 Jefferson advised a decimal system of weights and measures and suggested the length of a second pendulum as a unit.

The Chairman: Of course he could not recommend the metric system because it had not been invented.

Mr Bell: No; it was not introduced until later. Some action was taken by France in 1795, and in 1798 it was considered by some international gathering, but it was not legalized in France until 1801, and many years elapsed before legal standards were prepared.

* S. W. Stratton, Director of Bureau of Standards.

OUR WHOLE SYSTEM OF ARITHMETIC IS DECIMAL

There is one other point to which I desire to call attention, which seems to me to lie at the root of any proposed change in our methods of measurement in the direction of simplicity and ease of application, and it is this: We employ a decimal system of arithmetic; from which it follows that a decimal system of measurement will be more easy for us to handle than any system in which the units of measurement do not progress by tens.

Our whole system of arithmetic itself is decimal in character. In counting we employ 10 figures: 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9. We then repeat these in groups of 10, advancing from 10 to 20, 30, 40, etc., up to 99. We then advance by groups of 10 times 10, namely, 100, 200, 300, etc., to 999; then by groups of 10 times 100, namely, 1,000, 2,000, 3,000, etc., etc.

From this peculiarity in our method of numeration it follows that any system in which the units of measurement advance by tens is specially suited to our system of arithmetic. It enables us to change from one denomination to another in the system, as desired, without special calculation, by simply changing the place of the decimal point. Now the metric system is a decimal system of this character. It has already found favor with the world at large, and I think America should adopt it and make it her own. It really is astonishing, when you come to work out complicated problems involving cubical measure, specific gravity, and the relation of volume to weight, how much labor of calculation is saved by the use of the metrical measures.

The Chairman: If you will point out what that relation is specifically, perhaps it would be interesting. The members of the committee may understand, but I would like to see it.

Mr Bell: There is a simple relation between volume and weight: one cubic centimeter of water weighs one gram. That fact remembered is the key to the whole subject.

Now if you want to calculate the weight of any other substance you have simply to express its volume in cubic centimeters and multiply that by the specific gravity of the substance. Here is a piece of steel 10 centimeters long, one centimeter wide, and one-tenth of a centimeter thick (one millimeter). What is its weight?

Now you first find out the cubical contents of this piece of steel by multiplying together the length, breadth, and thickness expressed in centimeters so as to have the answer in cubic centimeters. It is 10 centimeters long and 1 centimeter wide; 10 times 1 is 10. It has a surface of 10 square centimeters, it is one-tenth of a centimeter thick. One-tenth of 10 is 1; that is, its volume is 1 cubic centimeter. Now multiply this by the specific gravity of steel and this will give you its weight expressed in grams. The specific gravity of steel, if I remember rightly, is somewhere about 8; that is, a piece of steel weighs about 8 times its own volume of water. Eight times 1 is 8. This piece of steel then weighs about 8 grams.

Now this happens to be a very simple case; but the process would give you the weight in grams, whatever the dimension of your piece of steel might be. If its volume should be one million cubic centimeters its weight would be eight million grams; that is, if I have correctly expressed the specific gravity by 8. If you wish to express this weight in kilograms, simply shift the decimal point three places to the left. A weight of 8,000,000 grams is equivalent to 8,000 kilograms.

The Chairman: The unit of length is what?

Mr Bell: One meter. A centimeter is one-hundredth part of that.

The Chairman: And that is equal to one liter, which filled with water is one kilogram, the unit of weight?

Mr Bell: The gram is the unit of weight; and one cubic centimeter of water weighs one gram. The liter is the unit of volume. It is equivalent to a cubical space 10 centimeters long, 10 centimeters wide, and 10 centimeters deep. It therefore holds 1,000 cubic centimeters of space; and if filled with water, the water would weigh 1,000 grams (or 1 kilogram).

The fact that one liter of water weighs one kilogram is easily remembered; but if forgotten the knowledge is readily recovered from the basal fact that one cubic centimeter of water weighs one gram (the unit of weight).

THE NEW NAMES SIMPLE WHEN UNDERSTOOD

To an American the metric system appears at first sight to be much more difficult of acquirement than it really is, on account of the un-English appearance of the terminology. After you have once mastered the meaning of the prefixes employed, the whole terminology appears to be beautifully simple and appropriate, the words expressing by their etymology the numerical relation to the units of the system.

Thus when we know that *deka* means ten, *hecto* one hundred, and *kilo* one thousand, we see at once that a *dekameter* means 10 meters, *hectometer* 100 meters, *kilometer* 1,000 meters. So with the multiples of gram: A *dekagram* means 10 grams, *hectogram* 100 grams, and *kilogram* 1,000 grams. So also, when we know that *deci* means one-tenth, *centi* one-hundredth, and *milli* one-thousandth, we see at once that *decimeter* means one-tenth of a meter, *centimeter* one-hundredth of a meter, and *millimeter* one-thousandth of a meter. In a similar manner when we examine the subdivisions of gram we see that a *decigram* means one-tenth of a gram, *centigram* one-hundredth of a gram, *milligram* one-thousandth of a gram, etc.

The foreign words employed need be no bar to the use of the metric system,

for they are really not necessary to the system at all—the English equivalents would do as well. It is convenient, however, for many reasons to have some means of expressing all these various denominations in specific words coined for the purpose, although the names are not all of equal importance. As a matter of fact, many of them are seldom used, and a few suffice for ordinary purposes. This greatly simplifies the nomenclature for English-speaking persons.

You will appreciate the point by reference to our monetary system. Our system of coinage provides for eagles, dollars, dimes ,cents, and mills; but, as a matter of fact, dollars and cents are sufficient for all ordinary purposes. We do not reckon money by eagles or dimes, and mills are hardly ever alluded to excepting by Congressmen and statisticians.

So, on the metric system, the terms *kilogram* and *gram* are generally sufficient to express weight; and the other terms provided, which Americans find some difficulty in remembering, are really of little importance because so seldom used.

The *meter* and *centimeter* are generally sufficient for ordinary purposes, although *millimeter* is also needed for fine measurements, and *kilometer* for long distance comparable to our mile, though little more than half its length.

The *liter* is necessary also in expressing volumes; but the multiples and subdivisions of it are not much used. These give you what may be called the basal points. It is not really necessary to use the other names, although advisable to possess them in case of need for special purposes.

The Chairman: Just as you would remember pounds and quarts and dollars and cents.

Mr Bell: Exactly.

The Chairman: When you know the value of anything expressed in one denomination you know it in all, by looking at it.

Mr Bell: Yes. And you are relieved of the enormous and unnecessary labor of calculation involved in the use of our present measures in merely translating from one denomination of the system to another.

The Chairman: Now, for the purposes of actual measurement, something has been said about the inch being a more convenient unit than the centimeter.

Mr Bell: I do not see any reason why an inch should be more convenient than a centimeter, excepting that we have become accustomed to it. Usage will familiarize us with the centimeter, and then our judgment will probably be just the other way.

The Chairman: Some of those who oppose the introduction of the metric system say that, so far as its actual use is concerned, there is no difference between the two systems, and others say that the inch is a more convenient unit; that the meter is not a convenient unit. There have been suggestions that it ought to be 40 inches.

Mr Bell: Is not the fact of the matter this: That anything you are accustomed to is convenient?

The Chairman: Yes; I think so.

OUR FOREIGN COMMERCE WOULD BE HELPED TREMENDOUSLY

Mr Bell: The metric system is already in extensive use. It has stood the test of a hundred years, and has displaced the older systems in most of the countries of the old world. The metrical units have proved to be very convenient there, and they will be equally convenient to us when we become accustomed to them and use them.

If we employed them, we would have the same system that is in use in most of the foreign countries with which we trade. The trade and commerce of the United States would then be enormously facilitated by reason of the fact of our using the same weights and measures employed by the people with whom we deal.

We cannot expect a Frenchman or an Italian to translate from pounds and ounces into kilograms and grams, etc.—to go through all this drudgery of translation—simply for the purpose of understanding the value of what he buys from us. So, of course, if he can get the things he wants from a country that already uses his own system of weights and measures he will do so in preference to buying from us, and American trade will suffer. In my opinion, the trade and commerce of the United States will be very much promoted by our adoption of that system of weights and measures which alone has any chance of becoming universal—the metric system.

The trade of Great Britain is already suffering from the competition of metric-using countries, and if we also adopt the system it will not be long before she follows our example. Then the metric system will become in fact the international system of the world.

We are better prepared to make the change than the British because we have already become accustomed to a decimal currency, and can therefore appreciate the benefits we derive from the application of the decimal principle to monetary affairs. I am hopeful, therefore, that our people may be made to see by analogy that we would derive similar benefits from the adoption of the decimal principle in our system of weights and measures.

WOULD NEW TOOLS IN OUR WORKSHOPS BE NECESSARY?

The Chairman: A good deal has been said on this point: We have been told that if we adopt the metric system it will necessitate the use of new tools and new workshops and thereby become a matter of great expense to our manufacturers.

Mr Bell: That is a matter for very grave consideration, and I think that the difficulty has been unduly magnified. While of course some of our more enterprising manufacturers would construct new machinery and tools specially adapted for metrical work, it does not necessarily follow that the old machines and tools would not be used for the purpose. The fact is that the change does not necessarily involve any change in tools or machinery at all—or at least not to any great extent. It is a question of arithmetic, not of tools or machinery. You can measure the work or output of the present tools and machinery just as well by the metric system as in the ordinary way. You can express the dimensions and weights of all the parts of the old machines, where required, by the metric system, and though the measurements might not be exact to a fraction of a millimeter or a fraction of a gram, they could be rated at their true metrical value, or at a closely approximated value in exact measure. It is only where very fine and accurate measurements are required that special tools would be needed.

The Chairman: In making a brand-new machine you very often have to have special tools in order to economically manufacture the machine.

Mr Bell: Yes. Of course the change would lead to the production of tools and machinery specially made for the metric system; but whether these tools are specially for this purpose or not, they can be measured by the metric system.

The Chairman: You mean by that this, do you not, Doctor: That eventually it would come to be that they would manufacture in even metric sizes as they now manufacture in even sizes of the English system?

Mr Bell: Yes, sir.

The Chairman: But it would not be an impossibility or a very great inconvenience to manufacture by the sizes they already have?

Mr Bell: No. I mean it would not be necessary to throw away the machinery and tools they now have, because generally you would have a sufficient approximation to some exact metrical measurement for practical purposes. We can

approximate say to a sixty-fourth of an inch, or a fraction of a millimeter, which would be near enough to precise figures ordinarily. The old tools and machinery need not be thrown away; they can be used during the transitional period at whatever may be their metrical value. A tool or machine has only a limited life. It may last, say, ten years, and then it must be replaced. After the adoption of the metric system the new machinery made would certainly be constructed to an exact metrical scale. The old machinery, however, so long as it lasted, would be measured by the metrical system, and you would simply rate it at its nearest equivalent in the metric system.

*Mr Scroggy:** I would like to ask a question in that connection. This bill, you must observe, uses the language that in the transaction of business requiring the use of weight and measurement the government shall employ and use the weights and measures of the metric system. That apparently is mandatory. Now could you suggest to this committee some amendment to that language by which the present tools, the tools now in use for manufacturing machinery that is now being manufactured, could still continue to be used, and at the same time adopt the metric system as contemplated by this bill?

Mr Bell: I do not think, sir, that this requires any amendment. The bill is only mandatory concerning the system of arithmetic to be used (the metric system), and leaves the question of tools, etc., open. It relates simply and exclusively to a method of measurement: The weights and measures of the metric system shall be used—that is all. It does not prescribe the kind of tools or machinery or limit it in any way.

Mr Scroggy: Do you think that the language would admit of the use of the present tools?

Mr Bell: You mean in the government departments?

Mr Scroggy: Yes.

Mr Bell: I have not hitherto given that point consideration, but I should think that it would. It simply refers to the measurement of them. Take the present tools and measure them in the metric system.

I thought you referred especially to outside firms undertaking business for the government, and whether they would be required to have new tools and machinery made in undertaking government work. I don't think they would, under the language of the bill. I have no doubt that some enterprising manufacturer would have metrical tools and appliances made for use in government work, though this does not seem to me to be required by the bill. The same remarks apply to the tools and appliances at present in use in the government departments themselves. I can see nothing in the bill to require their abandonment and replacement by tools specially constructed for metrical measurement. The present tools can be measured metrically, which is all that is required by the present bill, so far as I understand it. I do not therefore see why any amendment is required to permit the use of any kind of machinery that may be desired. The bill simply prescribes that in the transaction of business requiring the use of weight and measurement the departments of the government shall use the weights and measures of the metric system. Under this language I take it that you can use anything under the sun if you measure it by the metric system. You can use a pound weight if you please, if you put it down at 454 grams.

The Chairman: It would require the use of metric weights and measures, for instance, in the Treasury Department in determining our imports and things of that kind.

Mr Bell: Oh, yes.

The Chairman: There would be no difficulty about that, I should think.

Mr Bell: I don't think there would. Indeed, it might be possible that the labor

* Thomas E. Scroggy, Representative from Ohio.

of the department might be lightened, in fact, for I presume that goods imported from foreign countries employing the metric system are invoiced in the countries of their origin by the metric system, and the Treasury Department, or the importing merchants, at all events, would thus be saved the labor of translating the measures. The work of translation of the department would thus be limited practically to imports from Great Britain and her colonies.

The Chairman: Of course the equivalents of the metric system of weights and measures are enacted into law now.

Mr Bell: I believe so. I understand that the use of the metric system is already permissible in the United States by law. It is now competent for any one to use it legally who chooses. This bill takes the next step and makes its use mandatory upon the government departments; and of course if you take that step it means that you are going further with legislation in the future and make it mandatory for the whole country.

*Mr Dresser:** Has not there been some objection made on account of land measurements?

The Chairman: The bills formerly introduced here have always contained an exception, and that exception was the government survey; but that work is so nearly completed now that I am told the author of this bill thought it was not worth while to except that from its provisions.

Mr Bell: Of course there is necessary friction in making the change, but this difficulty only belongs to the transition period.

The Chairman: I suppose there are about three things that the ordinary man or woman—I mean the man who has not any special use for weights and measures, but uses them ordinarily in trade—would have to remember, and that is the liter, the meter, and the kilogram; the liter, one-tenth more than a quart; the meter, one-tenth more than a yard; and the kilogram, one-tenth more than two pounds, about?

Mr Bell: Yes; that is a very simple way of memorizing the radical points.

A CHANGE WOULD CAUSE NO SERIOUS ANNOYANCE

The Chairman: Do you imagine there will be any serious annoyance, so far as what we call the common people are concerned?

Mr Bell: I do not anticipate it. We simply have to be bold enough to take the step. All the difficulties lie in the transition period. All the difficulties in the metric system are in translating from one system to the other, but the moment you use the metric system alone there is no difficulty. The workmen in my laboratory used the metrical weights and measures right off. I did not ask them to translate from one system to the other, for that would speedily have developed their limitations of education. I simply asked them to use the metric system, and they did it without difficulty. They now use meters and centimeters and grams and kilograms as if to the manner born, and they are simply common carpenters and mechanics. I consider them as an average sample of the common people. I do not anticipate any difficulty in the use of the metric system by itself; and if the government will lead the way, the change must and will come, and we will be brought into line with the progressive nations of the world, instead of lagging behind.

Mr Scroggy: Legislating for the future and not for the past generations?

Mr Bell: Yes, sir. Our forefathers legislated pretty well for the future in the adoption of the Constitution; and, later, Congress did well in abolishing the old system of pounds, shillings, and pence and adopting the decimal system for our money; and we will do well for the future of our country if we provide the metric system for the whole of the United States.

* Solomon R. Dresser, Representative from Pennsylvania.

S. P. LANGLEY

S. P. LANGLEY, Secretary of the Smithsonian Institution, 1887-1906, who died on February 27, was probably the first astronomer to succeed in making money for the public out of his profession. When he was appointed director of the observatory at Allegheny its resources comprised a building and very few instruments. He had to raise money before he could do any scientific work, and it occurred to him that the easiest and most useful way of doing this was to sell a standard time to the railways. In 1866 the railroads east of Chicago were running on different local times, and there was considerable confusion in consequence. Mr Langley proposed to determine his time from the sun and to sell it to the railways. His plan proved very popular with them, and the writer was informed by Professor Langley a few months before his death that he obtained in this way about $60,000, with which he equipped the observatory and continued his solar work. Mr. Langley thus originated our system of standard time in the United States.

Professor Langley believed that the most important work for astronomers was to study the sun, which is the basis of all life on the earth.

He wrote a delightfully entertaining book on this subject, illustrated from his own drawings and published by The Century Company, called "The New Astronomy."

At the Allegheny Observatory and on his various expeditions to Mount Whitney and elsewhere, as well as during the twenty years he directed the Astrophysical Observatory at Washington, the character of the sun, sun-spots, the solar constant, etc., formed the principal object of his researches.

His invention of the bolometer, which registers as small a change in temperature as one-hundred-millionth of a degree of heat, enabled him to extend the visible spectrum many times beyond what was previously seen.

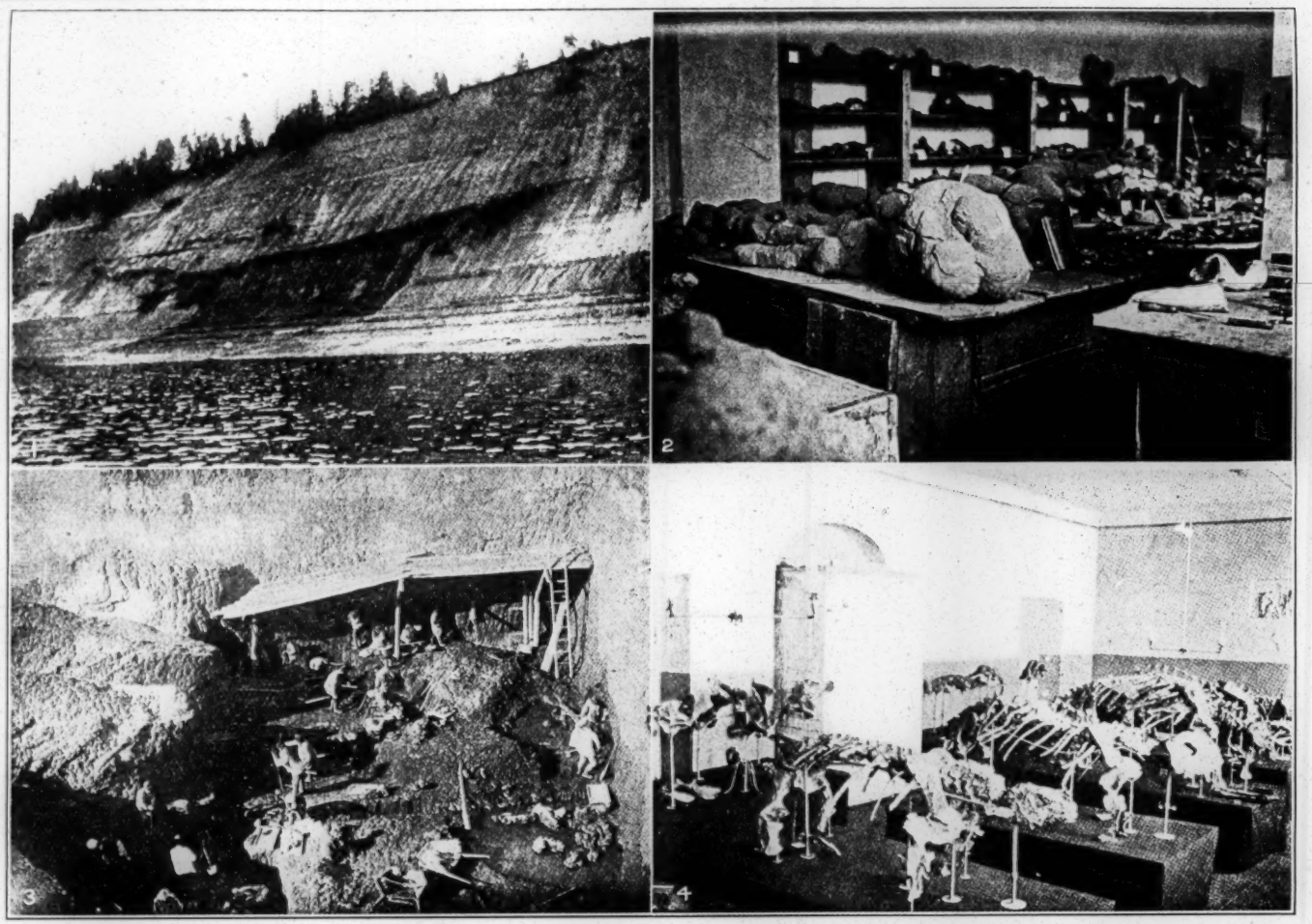
It is not the purpose of this brief note to enumerate Professor Langley's scientific achievements, but rather to direct attention to the wide range of subjects to which he actively contributed. An architect in early life; later a professor of mathematics in Harvard University; the originator of our system of standard time; he re-established the solar constant; discriminated and accurately determined, by their temperature alone, over 700 lines in the invisible infra-red spectrum; discovered important principles in mechanical flight; was one of the principal promoters of our National Zoölogical Park, and possessed a literary talent which enabled him to describe the most abstruse scientific facts in a manner intelligible and fascinating to all.

But his greatest contribution was his work in aerodynamics and on the internal energy of the wind. His experiments and published results on the dynamics of the air are the foundation of the flying machines of the future. Mr Langley was the first American to maintain that the flying machine must be of the "heavier than air" instead of the balloon type, demonstrating that less energy is required to support a heavy body in rapid velocity than in slow velocity.

EXTINCT REPTILES FOUND IN NODULES

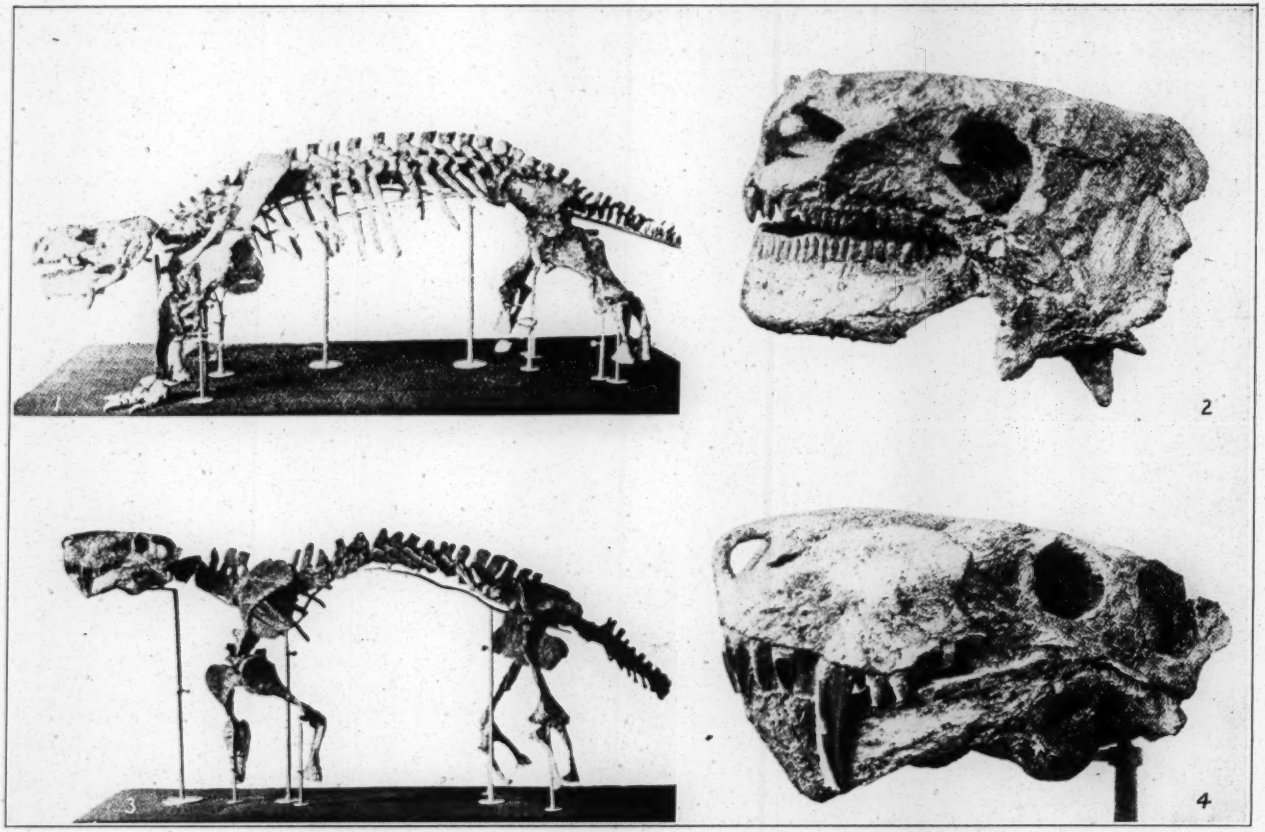
THE sandy cliffs of the river Dwina, near Archangel, in northern Russia, are discolored in places by pockets of darker material, from which the local road-builders have been accustomed to extract nodules of stone for mending the roads.

Professor Amalitzky, of Warsaw, on visiting this locality a few years ago, was astounded to find that each nodule contained the bones of an extinct animal. Some of the larger nodules contained the head, limbs, and even the



From "Extinct Animals," by E. Ray Lankester, Henry Holt & Co.

1. View of one of the Dark Patches in the Cliffs of the River Dwina (the northern of that name), where nodules containing the skeletons of extinct reptiles are found
2. Prof. Amalitzky's Work-shop in Warsaw, showing skeleton-holding nodules ready to be broken open and others already under preparation
3. Peasants working on the face of the Cliff near Archangel and removing nodules containing the skeletons of great reptiles
4. A Series of Skeletons of Pariasaurus removed bit by bit from Archangel nodules and mounted as detached specimens by Prof. Amalitzky



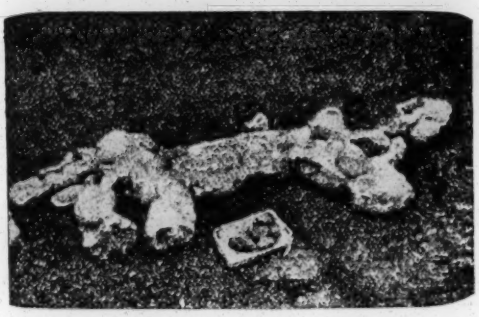
From "Extinct Animals," by E. Ray Lankester, Henry Holt & Co.

1. Photograph of a Skeleton of Pariasaurus removed from an enveloping nodule and mounted by Prof. Amalitzky
2. Photograph by Prof. Amalitzky on a larger scale of a Skull of a Pariasaurus from an Archangel nodule
3. Skeleton of a Huge Carnivorous Beast of Prey, the reptile named Inostransevia, discovered and photographed by Prof. Amalitzky, of Warsaw. The skull alone is two feet high
4. Skull of the Gigantic Theromorph Carnivorous Reptile, Inostransevia, discovered by Prof. Amalitzky in northern Russia. It is allied to Lycosaurus, found in Cape Colony in beds of the same age

entire skeleton of a creature about eight feet long.

Large numbers of these nodules have been transferred to the laboratory of Professor Amalitzky, where they have been opened and the contents studied. The contained bones, which appear to be the remains of reptiles of Triassic age, have been carefully extracted and put together in skeleton form by means of iron supports. Several skeletons have thus been revealed of the extinct *Pariasaurus,* a vegetarian reptile about as large as an ox, but not so high in the legs.

The nodules have also disclosed the remains of a huge carnivorous reptile



One of the Nodules, showing form of the embedded skeleton; head to right, tail to left

with a skull two feet long and enormous tiger-like teeth—a truly terrible creature which has received the equally terrible name of *Inostransevia* from its discoverer, Professor Amalitzky.

No doubt the vegetarian herds of *Pariasaurus* were preyed upon by the carnivorous *Inostransevia* in the old days—now hundreds of thousands of years ago—when they roamed at large over the territory now known as northern Russia.

A brief account of Prof. Amalitzky's discoveries is given in a recent work on "Extinct Animals" by Dr. E. Ray Lankester, of London, England, from which the above facts have been extracted. (Published by Henry Holt & Co., New York, 1905.) The whole book is of fascinating interest. It is written largely in untechnical language, and is plentifully illustrated by photographs and drawings of the remains of extinct animals. The author's name is a sufficient guarantee of the excellence of the work and the reliability of the information. H. A. LARGELAMB.

AMERICAN GOODS IN CHINA

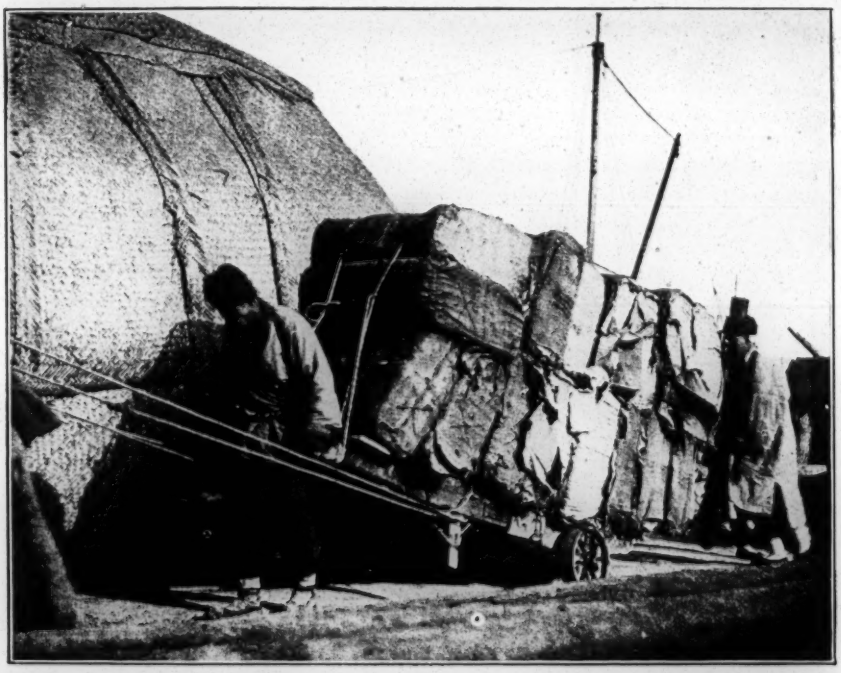
A NUMBER of photographs have been sent to the Bureau of Manufactures by Special Agent Crist showing the condition of the average American case or bale of goods on arrival in Tientsin, China. Three of these photographs are given on pages 174-175, by courtesy of the Bureau, and also a photograph of some Holland bales that arrived at the same time. Mr Crist reports that from the place where he took the photographs at least 500 more American bales in equally bad shape were to be seen. Those in best condition were bound with iron straps, while the rope-tied bales suffered the most.

EVIDENCE OF RECENT VOLCANIC ACTION IN SOUTHEAST ALASKA

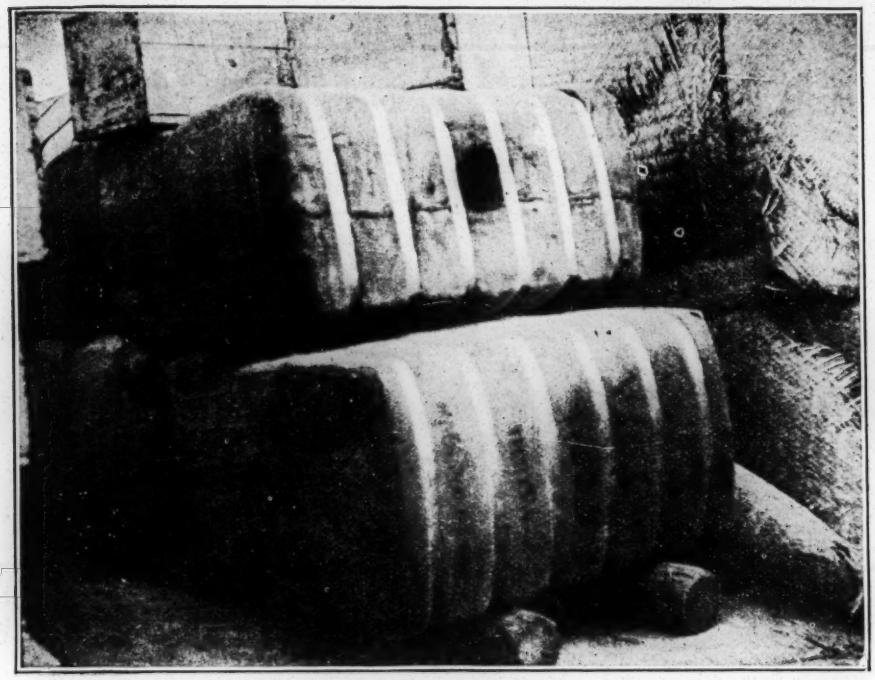
THE following interesting geographical information is extracted from a report by Mr Fremont Morse, of the U. S. Coast and Geodetic Survey, who was recently engaged in the demarkation of the Alaskan boundary line across the Unuk River, and is published here through the courtesy of Mr O. H. Tittmann, Superintendent of the U. S. Coast and Geodetic Survey. The Unuk River flows into Burroughs Bay about 95 miles north of the southern boundary of Alaska. The locality described is inland at the boundary and about 30 miles from the mouth of Burroughs Bay.

The largest tributary to the Unuk on the north side, between Burroughs Bay and the boundary, occupies a valley of considerable size between boundary peaks 6,200 and 6,500. This stream is

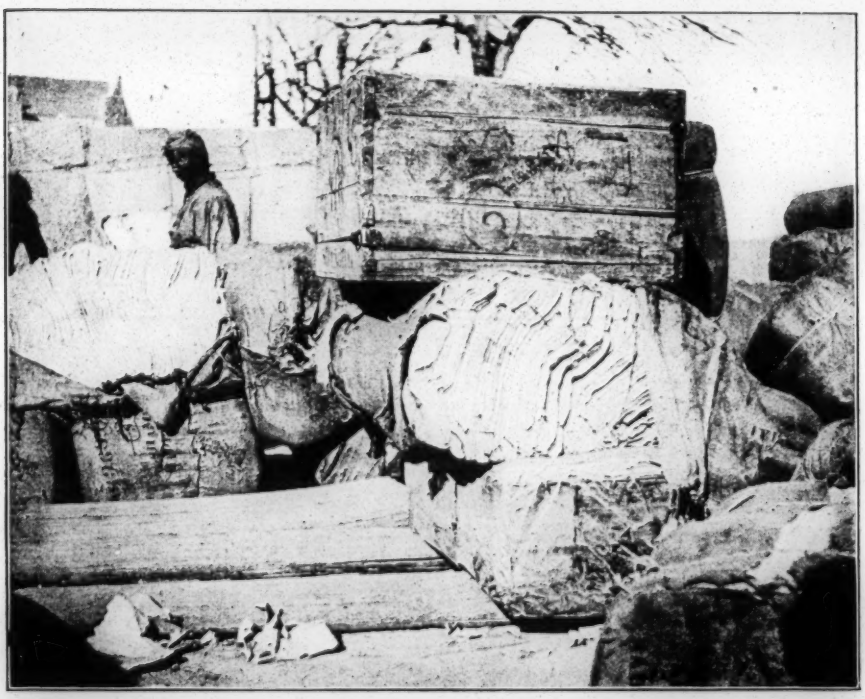
Condition of American Case Goods on arrival at Tientsin, China



Trusses of American Piece Goods on arrival at Tientsin



Bales of Piece Goods from Holland on arrival at Tientsin



A Typical Pile of American Piece Goods on arrival at Tientsin

locally known as Blue River, and it empties into the Unuk River in the first canyon. This canyon has been formed by a lava flow which came down the Blue River valley and forced the Unuk stream over against the foot of the mountain on the south bank. This flow is comparatively recent, but occurred long enough ago for large trees to have grown up over its surface. A still more recent flow, which probably occurred within less than fifty years, has swept down the Blue River valley, destroying all the vegetation in its path. This flow stopped within about 200 or 300 yards of the river, and the charred and blackened trunks of trees overwhelmed by it are still visible at its termination. Since the flow ceased there has been time for only a few mosses and lichens to gain a foothold on the lava masses. The floor of the Blue River valley, as formed by this lava, is exceedingly rough and broken up, and it is very difficult to travel over it. It was stated to us that, owing to the extreme difficulty of crossing the lava, the farthest point ever reached up the valley is seven miles, which distance was once made by a prospector in three days' travel. In a letter sent Mr Tittmann after the report, Mr Morse adds:

"I judge the lava flow had its source in the region north from 6,200, say within 10 miles of that peak. The ruggedest mountains in the vicinity are there and look as if they are volcanic. Looking in that direction from 6,200, there is seen a glacier whose entire front is black with cinders. The glacier on the north side of 6,200, which has its lower extremity at an altitude of about 3,500 feet, is still discharging cinders that probably fell during the last eruption. So also the ledges that are exposed during the summer above 3,500 feet have cinders scattered over them, and that too in exposed places where it seems improbable that the cinders could rest many years without being blown away by winds or washed away by rains. At present there is no sign of an active volcano in that region. Mr Wright, of the Geological Survey, who made a trip up the Unuk River in August, made the ascent of 6,200 to see the surrounding country; but it was a cloudy day and he did not get the view which I have mentioned. He suggested that a lava flow does not necessarily imply a volcano, but may come from a fissure, and that just in that region is the line between the coast granites and the interior rocks. However that may be, it is certain that there were lively times around the Blue River valley not many years ago.

"The second canyon of the Unuk was formed in precisely the same way as the first, and by a lava flow which had its origin in about the same locality, but which, instead of flowing down the Blue River, broke out and flowed down the other side of the range on which 6,200 is located. All this flow is clad with timber and occurred long ago."

THE WONDERFUL STRIDES OF AFRICA

THE article on "Morocco" published in this number is the first of a series of articles on different parts of Africa which will appear in THE NATIONAL GEOGRAPHIC MAGAZINE at intervals during 1906. The following papers, all of which will be illustrated, have been arranged: "Africa from Sea to Center," by Herbert L. Bridgman, being an account of the development of Egypt and more particularly of the Sudan, of Khartoum, and the upper reaches of the Nile; "Capetown, the Transvaal and Rhodesia," by William M. Davis, professor of geology in Harvard University, who will tell of the amazing progress of South Africa since the war and of the labor and race problems there, which are far more complicated than our own similar problems; "Northern Nigeria," by Mr Douglas Hume, a member of the National Geographic Society, who for three years past has been in Northern Nigeria; this paper will describe the peaceful annexation and

commercial development by the British during the last five years of 500,000 square miles in equatorial Africa, with a vigorous semi-civilized population of 20,000,000; "The French Empire in Africa," being an account of the French work in Algeria, Tunis, and more especially their ambitions for the transformation of the Sahara Desert, by Charles Rabot, editor of "La Geographie," of Paris.

U. S. BOARD ON GEOGRAPHIC NAMES

IT is hereby ordered that there be added to the duties of the United States Board on Geographic Names, created by Executive order dated September 4, 1890, the duty of determining, changing, and fixing place names within the United States and insular possessions, and it is hereby directed that all names hereafter suggested for any place by any officer or employee of the government shall be referred to said board for its consideration and approval before publication.

In these matters, as in all cases of disputed nomenclature, the decisions of the board are to be accepted by the departments of government as the standard authority.

THEODORE ROOSEVELT.

The White House, January 23, 1906.

GEOGRAPHIC LITERATURE

Jungle Trails and Jungle People. By Caspar Whitney. Pp. 310, 8 vo. New York: Charles Scribner's Sons. 1905.

A series of fascinating narratives of hunts for big game in Siam, Burma, the Malay States, and Sumatra, sprinkled through which is a lot about the country and the people, their life, thoughts, and characteristics. One is struck with the characterization of the Malays of the Federated States, which holds good wherever Malays are found. "He was very rarely the bloodthirsty, sullen, silent creature of which we have had so often the pen picture. He is, to be sure, thriftless, indolent, unambitious, but he is polite, good-natured, contented . . . above all else . . . the Malay is intensely self-respecting . . . He is reserved, self-contained . . . He resents insult so strongly that bloodshed may result . . . is deliberate of speech . . . and is not demonstrative. He walks erect and he looks you in the eye." The Philippine Malay is all this, except that he is ambitious, and will work to better his condition.

The book is printed on heavy paper, and is beautifully and appropriately illustrated H. G.

From "Africa," by Frank G. Carpenter, Copyrighted

Disembarking Passengers, Portuguese East Africa. The passenger enters the basket and is swung overboard.

Carpenter's Geographical Reader — Africa. By Frank G. Carpenter. Pp. 336. Six maps and numerous illustrations. 7½ by 5½ inches. New York: American Book Company.

With this volume Mr Carpenter completes his series of Geographical Readers

of the World, the volumes on "North America," "South America," "Europe," "Asia," "Australia, Our Colonies, and other Islands of the Sea" having preceded this one. The readers are designed for young people. They are written in simple and interesting language and the facts are in the main correct. Their popularity is attested by the statement that more than one million copies of the volumes have been sold.

Far East (The). By Archibald Little. Illustrated. Pp. 342. Oxford: The Clarendon Press. 1905.

This is a description of the Chinese Empire and its neighbors, from Manchuria to Siam, and from Turkestan to Japan. Despite its literary defects, it is a welcome handbook, its value being enhanced by charts and maps, especially those on railways, population, ethnography, orographic features, and vegetation. The chapters on Siam, Tibet, Turkestan, and Japan are inferior to those on the central kingdom—China.

The account of the middle basin, the Yangste, is comprehensive and interesting, the author speaking largely from personal study, evidently not like a writer he describes, who "labored under the disadvantage of never having lived in the country."

He forcibly presents the relative size and importance of China and other countries, and gives much needed information as to local geography, geology, and climate.

Most instructive is the irrigation district in Szechuan province, 2,800 square miles, as "the most highly productive and thickly populated piece of land of its size on the face of the globe." Its skillful and continued maintenance "is due to the absolute dependence of the five millions of people on the Chengtun Plateau upon the minute organization of their irrigation system."

The unreliability of statistics as to population is well illustrated by two estimates as to the population of Annam, Tongking, and Laos, 6,200,000 by Bernard (1901) and 15,400,000 by Beauclerc (1900).

Americans may well take to heart Mr Little's opinion, the outgrowth of long experience and reflection, that consideration and fair dealing in all commercial and economical matters are essential to successful relations with the Chinese.

A. W. G.

NATIONAL GEOGRAPHIC SOCIETY

Popular Meetings

National Rifles Armory, 920 G street, N. W., 8 p. m.

Friday, March 2—"Our Immigrants: Where They Come from, What They Are, and What They do After They Get Here." Illustrated. Hon. F. P. Sargent, Commissioner General of Immigration.

Thursday, March 15—"Castro and Venezuela." By James F. T. Archibald, of Collier's Weekly.

Friday, March 23—"Oriental Markets and Market Places." By Hon. O. P. Austin, Chief U. S. Bureau of Statistics. Illustrated.

Friday, March 30—"United States Eclipse Expedition, 1905." By Rear Admiral Colby M. Chester, U. S. N.

Tuesday, April 13—It is hoped that official business will permit the Secretary of the Navy, Hon. Charles J. Bonaparte, to address the Society on "The American Navy."

Scientific Meetings

Hubbard Memorial Hall, 8 p. m.

Friday, March 9—"The United States Bureau of the Census." By Hon. S. N. D. North, Director, Bureau of the Census.

Saturday, March 24—"The Death Valley." By Mr Robert H. Chapman, U. S. Geological Survey.

Friday, April 6—"Hunting with the Camera." By Hon. George Shiras, Member of Congress from the third district of Pennsylvania.

Friday, April 20—"The Protection of the United States Against Invasion by Disease." By Dr Walter Wyman, Surgeon General Marine Hospital Service.

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